PROCESSES AND PROPERTIES INDEX

CA

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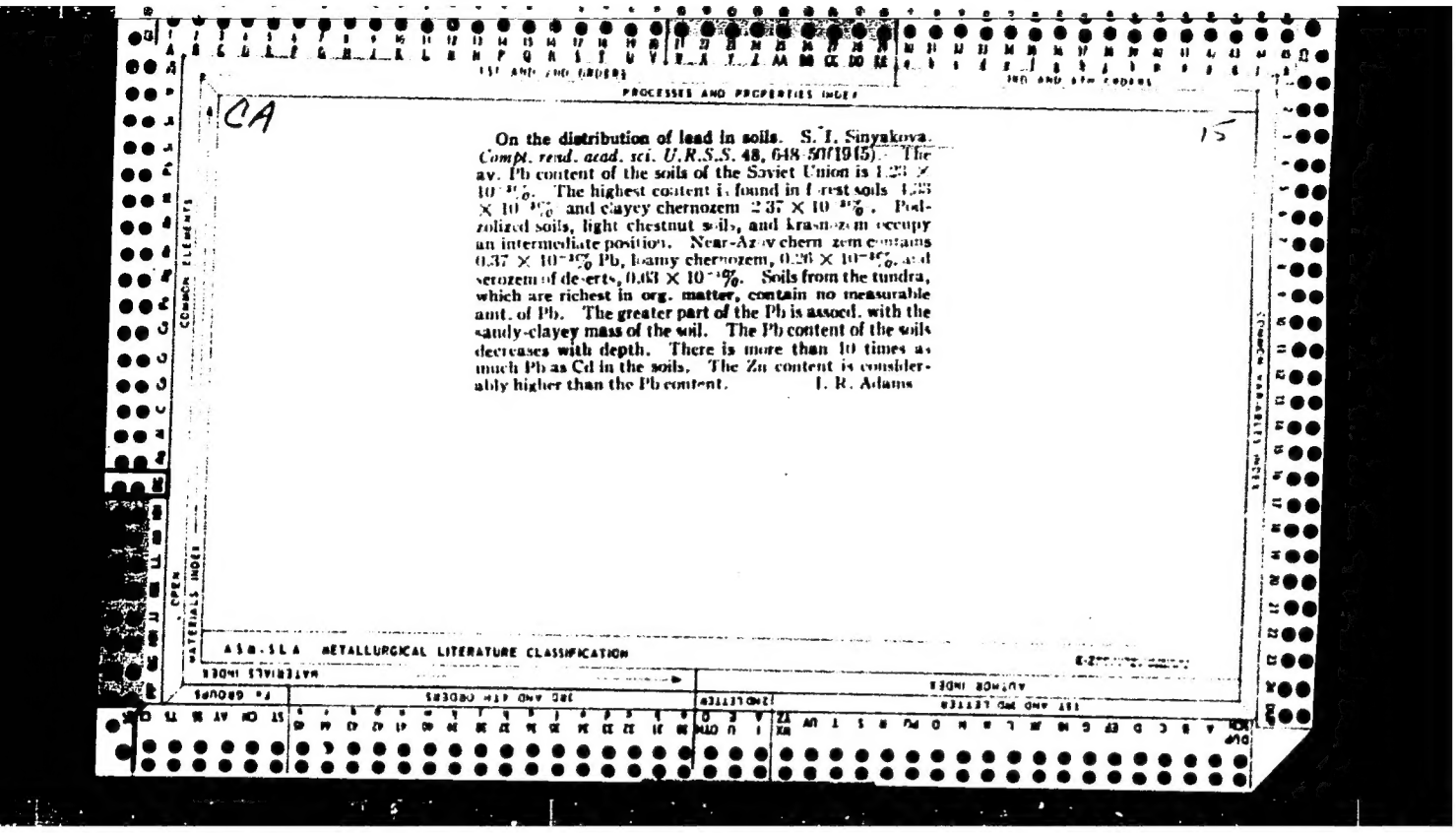
The content of lead in plants. S. I. Sinyakova. *Compt. rend. acad. sci. U.R.S.S.* **48**, 414-15(1945)(in English).—Samples (100 g.) of air-dry plant material were ashed at not over 500°. The ash was dissolved, SiO_2 sepd., and Pb extd. with dithizone, and detd. by the polarographic method. Species belonging to the *Gramineae* contained the largest amt. of Pb (*Panicum crus-galli*, 1.55 × 10^{-4}% of ash) with individual species contg. as low as 0.15 × 10^{-4}% of ash (*Stipa capillata*) in this family. No Pb was found in representatives of the families Caryophyllaceae, Papilionaceae, Potamogetonaceae or Ulvaceae. The content of Pb in the ash of terrestrial plants ranged from n × 10^{-5} to n × 10^{-4}%, where n varies from 0.8 to 7.6. The corresponding soils contained n × 10^{-3}%, of which n × 10^{-4}% was acid sol. Carl S. Gilbert

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

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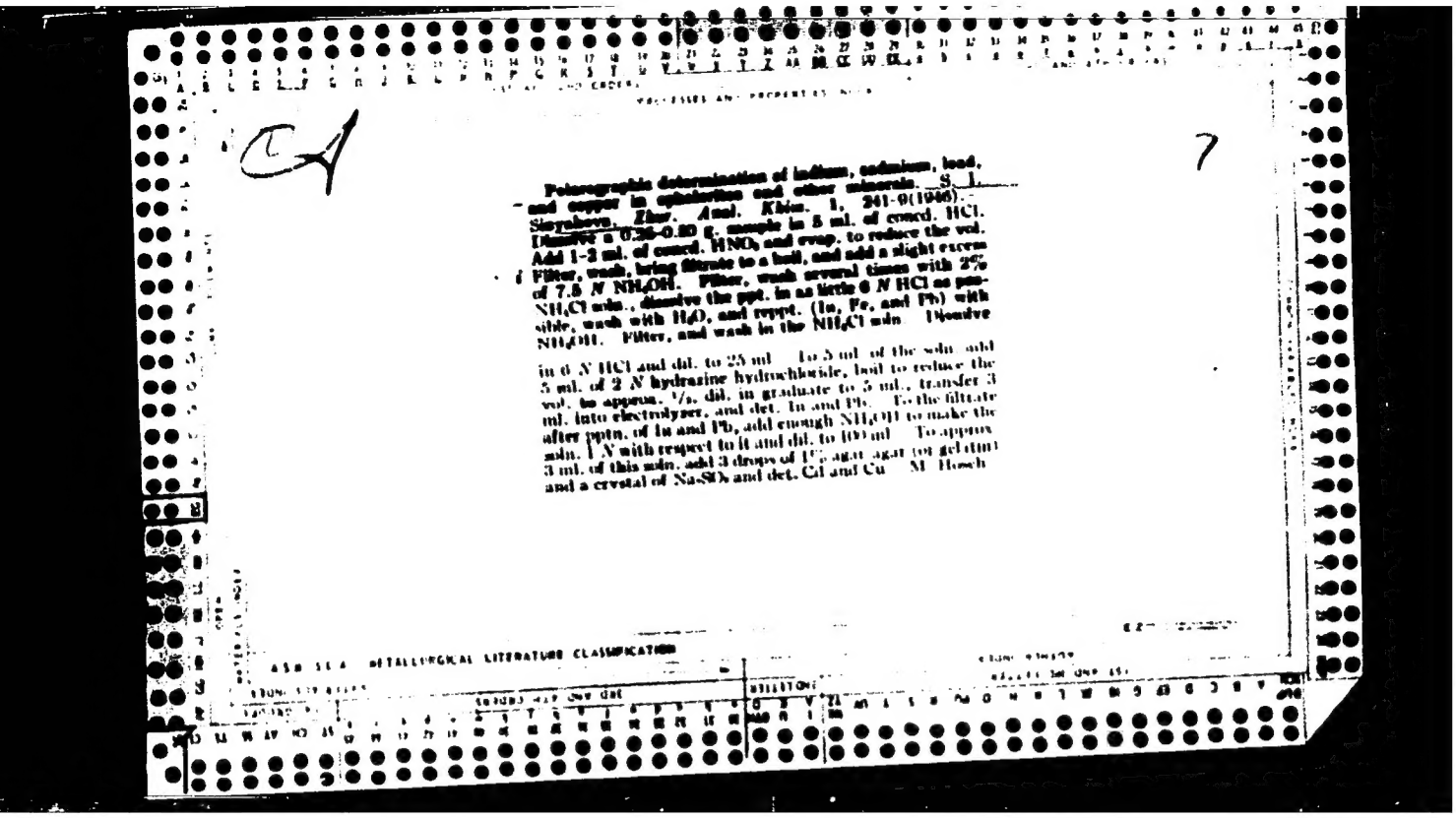
On the distribution of lead in soils. S. I. Sinyakova. *Compt. rend. acad. sci. U.R.S.S.* 48, 648-50(1945). The av. Pb content of the soils of the Soviet Union is 1.23×10^{-3}%. The highest content is found in forest soils 1.35×10^{-3}% and clayey chernozem 2.37×10^{-3}%. Podzolized soils, light chestnut soils, and krasnozem occupy an intermediate position. Near-Azov chernozem contains 0.37×10^{-3}% Pb, loamy chernozem, 0.26×10^{-3}%, and serozem of deserts, 0.03×10^{-3}%. Soils from the tundra, which are richest in org. matter, contain no measurable amt. of Pb. The greater part of the Pb is assocd. with the sandy-clayey mass of the soil. The Pb content of the soils decreases with depth. There is more than 10 times as much Pb as Cd in the soils. The Zn content is considerably higher than the Pb content. I. R. Adams

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Polarographic determination of indium, cadmium, lead, and copper in sphalerites and other minerals. S. I. Sinyakova. *Zhur. Anal. Khim.* 1, 241-9(1946).—Dissolve a 0.25-0.50 g. sample in 5 ml. of concd. HCl. Add 1-3 ml. of concd. HNO_3 and evap. to reduce the vol. Filter, wash, bring filtrate to a boil, and add a slight excess of 7.5 *N* NH_4OH. Filter, wash several times with 2% NH_4Cl soln., dissolve the ppt. in as little 6 *N* HCl as possible, wash with H_2O, and reppt. (In, Fe, and Pb) with NH_4OH. Filter, and wash in the NH_4Cl soln. Dissolve in 6 *N* HCl and dil. to 25 ml. To 5 ml. of the soln. add 5 ml. of 2 *N* hydrazine hydrochloride, boil to reduce the vol. to approx. ½, dil. in graduate to 5 ml., transfer 3 ml. into electrolyzer, and det. In and Pb. To the filtrate after ppta. of In and Pb, add enough NH_4OH to make the soln. 1 *N* with respect to it and dil. to 100 ml. To approx. 3 ml. of this soln. add 3 drops of 1% agar-agar (or gelatin) and a crystal of Na_2SO_3 and det. Cd and Cu. M. Hosch

SINYAKOVA, S. I.

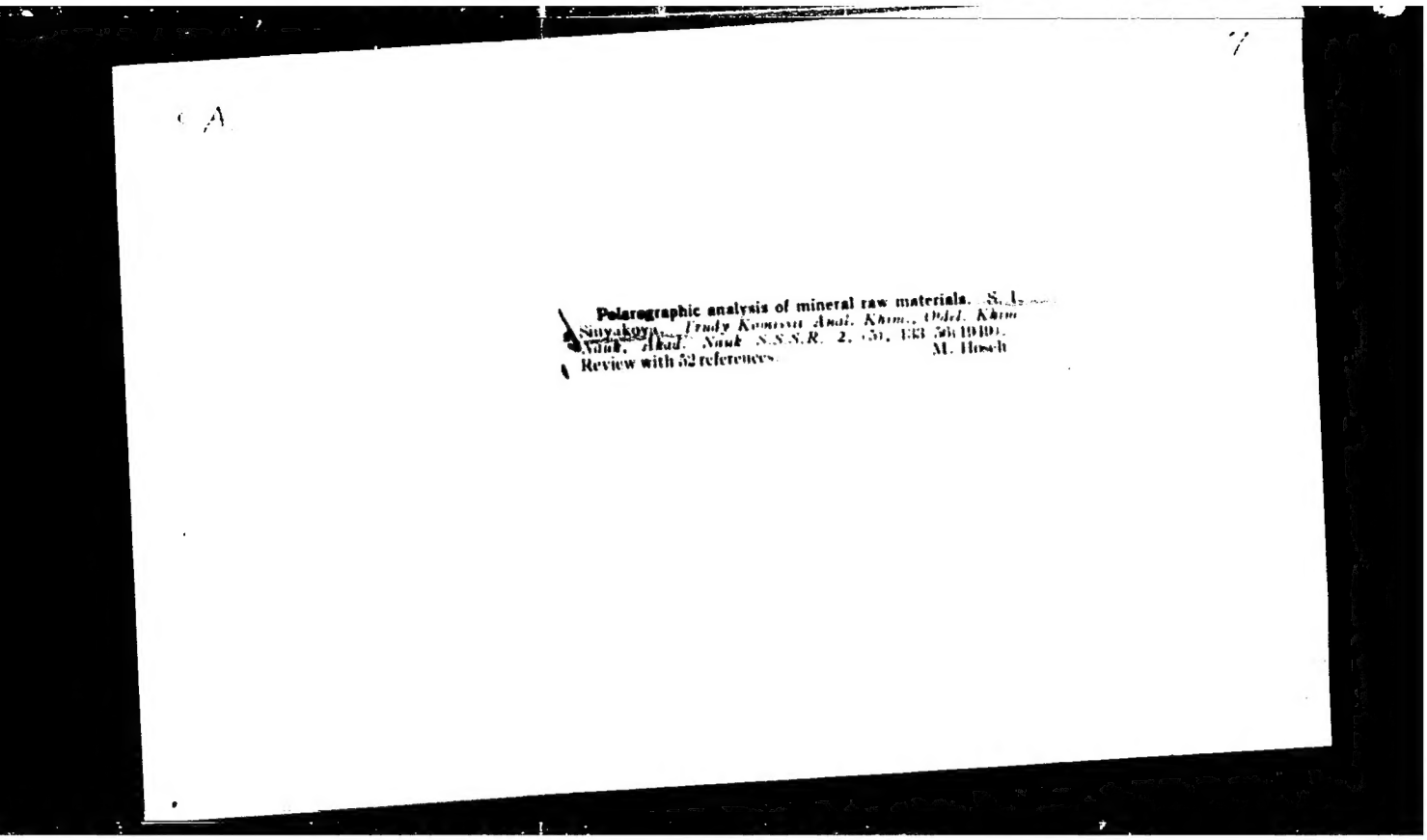
Vernaksky Lab. of Geochem. Problems, Acad. Sci., (-1946-)

"Polarographic Determination of Indium, Cadmium, Lead and Copper in the Sphalerites and Other Minerals,"

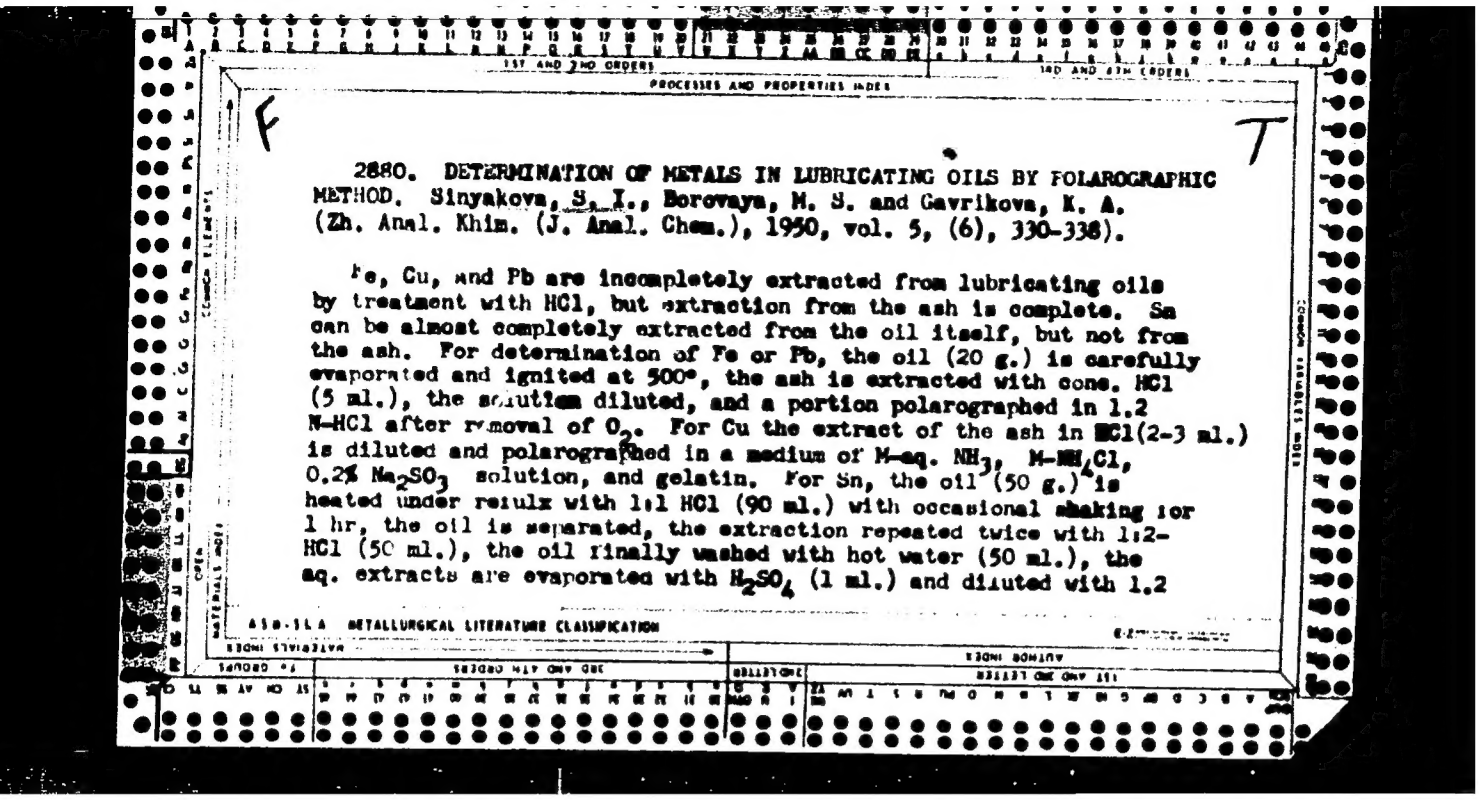
Zhur. Analit. Khim., No. 4, 1946

Reduction of nitrate ion on a dropping-mercury cathode Polarographic determination of nitrate nitrogen in reagents. S. I. Sinyakova and G. G. Karanovich. *Trudy Komissii Anal. Khim., Otdel. Khim. Nauk, Akad. Nauk S.S.S.R.* 2, (5), 65–80 (1949).—The reduction of NO_3^- was studied in solns. of La, Nd, Ce, Ca, and Mg chlorides, UO_2^{++}, and some anions. In $LaCl_3$ and $NdCl_3$ the reduction of 1 mol. NO_3 required 7 F which is taken to indicate that nitride and hydroxylamine are formed. In $CeCl_3$ solns. of pH 2.5, the product was N. SO_4^{--} (0.02 mg./ml.) depressed the diffusion current when NO_3^- was reduced in solns. of rare earth chlorides. This effect of SO_4^{--} was stronger in solns. of $NdCl_3$ than in $LaCl_3$ and $CeCl_3$. K and Na had no effect on the diffusion current, Ca lowered it by approx. 6%, and Mg by approx. 45%. In $CaCl_2$ solns. NO_3 was reduced in the absence of other cations, but the diffusion current was lower than in the presence of La^{+++}. In $MgCl_2$ solns. La^{+++} did not affect the diffusion current. The half-wave potential of NO_3 was −1.815 v. In the presence of UO_2^{++} a well defined wave of NO_3^- was obtained having a half-wave potential of −1.0 v. The diffusion current of NO_3^- in UO_2^{++} solns. increased somewhat as the concn. of NO_3 decreased. The reduction reaction was more complicated than the formation of N. In UO_2^{++} solns. K and Mg did not affect the diffusion current, Na increased it by 6–7%. It did not affect its magnitude but caused it to shift to positive value, SO_4^{--} affected the diffusion current only when present in concns. of 1.0–2.0 or more mg./ml.

M. Hosh



Polarographic analysis of mineral raw materials. S. I. Syrokova. *Trudy Komissii Anal. Khim., Otdel. Khim. Nauk, Akad. Nauk S.S.S.R.* 2, 51, 133–56 (1950). Review with 52 references. M. Hosch



PROCESSES AND PROPERTIES INDEX

F T

2880. DETERMINATION OF METALS IN LUBRICATING OILS BY POLAROGRAPHIC METHOD. Sinyakova, S. I., Borovaya, M. S. and Gavrikova, K. A. (Zh. Anal. Khim. (J. Anal. Chem.), 1950, vol. 5, (6), 330-338).

Fe, Cu, and Pb are incompletely extracted from lubricating oils by treatment with HCl, but extraction from the ash is complete. Sn can be almost completely extracted from the oil itself, but not from the ash. For determination of Fe or Pb, the oil (20 g.) is carefully evaporated and ignited at 500°, the ash is extracted with conc. HCl (5 ml.), the solution diluted, and a portion polarographed in 1.2 N-HCl after removal of O_2. For Cu the extract of the ash in HCl (2-3 ml.) is diluted and polarographed in a medium of N-aq. NH_3, N-NH_4Cl, 0.2% Na_2SO_3 solution, and gelatin. For Sn, the oil (50 g.) is heated under reflux with 1:1 HCl (90 ml.) with occasional shaking for 1 hr, the oil is separated, the extraction repeated twice with 1:2-HCl (50 ml.), the oil finally washed with hot water (50 ml.), the aq. extracts are evaporated with H_2SO_4 (1 ml.) and diluted with 1.2

A 51-51 A METALLURGICAL LITERATURE CLASSIFICATION

the pendulum and the hardness according to Shore. This time increases approximately proportionally with the increase in the hardness according to Shore.

SINYAKOVA, S.I.

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Chemical Abst.
Vol. 48 No. 8
Apr. 25, 1954
Analytical Chemistry

Spectrophotometry in chemical analysis. S. I. Sinyakova and N. P. Ivanov (V. I. Vernadskii Inst. Geochem. Anal. Chem., Moscow). *J. Anal. Chem.* (U.S.S.R.) 7, 258-301 (1952) (Engl. translation).—See *C.A.* 47, 5204g. H. L. H.

SINYAKOVA, S.I.

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(2)

Chemical Abstracts
May 25, 1954
Analytical Chemistry

Use of complexes in polarography. Determination of titanium. S. I. Sinyakova (V. P. Vernadskiĭ Inst. Geochem. Anal. Chem., Acad. Sci. U.S.S.R., Moscow). *Zhur. Anal. Khim.* 8, 333–9(1953).—Ti was detd. polarographically as a Trilon B complex in a NaOAc soln. The optimum condition for this detn. is in a 2*M* NaOAc soln. which is 0.1*M* with respect to Trilon B. The pH of the soln. is 4.5–5.0. Under these conditions the $E_{1/2}$ = −0.473 v. The Ti content is best kept at 2.34 × 10^{-4}–2.34 × 10^{-3} moles/l. It is preferable to dissolve Trilon B in NaOAc soln. and to this add the Ti soln. Fe, V, and Cu interfere and should be removed. Cr is practically without effect on this detn. M. Hosek

11-11-54
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SINYAKOVA, S. I.

USSR/Chemistry - Polarographic analysis

Card 1/1 : Pub. 145 - 1/10

Authors : Gokhshteyn, Ya. P.; Sinyakova, S. I.; and Yukhtanova, V. D.

Title : Adaptation of oscillographic polarography for quantitative determination of Ti

Periodical : Zhur. anal. khim. 9/5, 255-264, Sep-Oct 1954

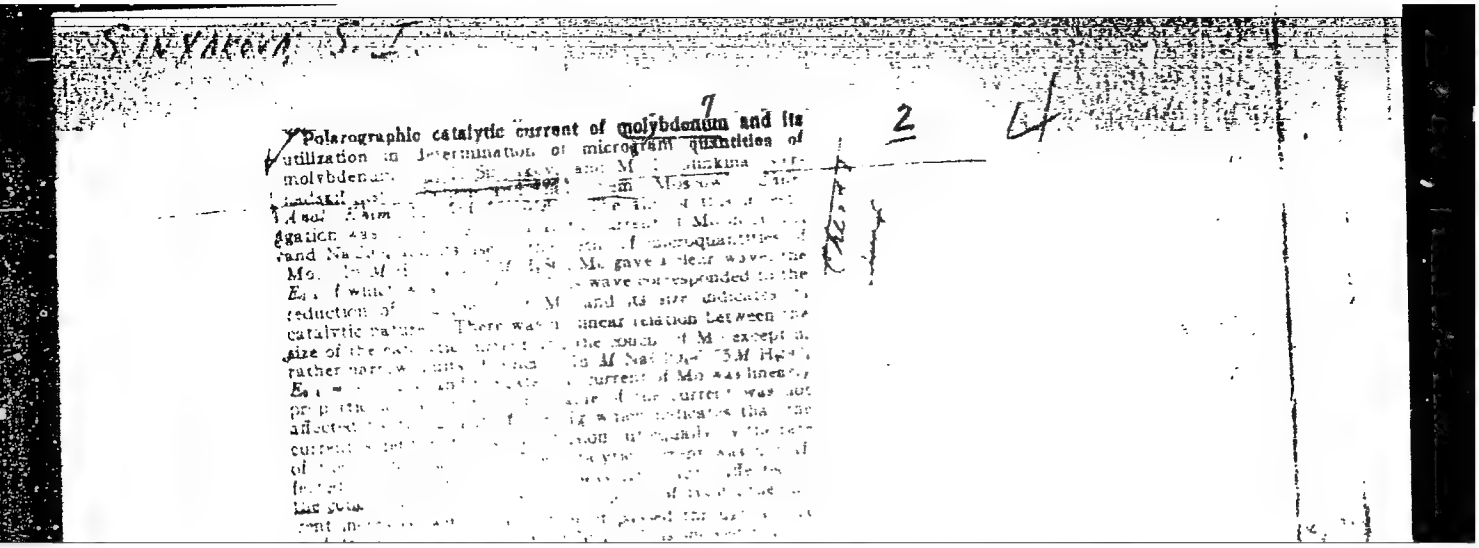
Abstract : A method for polarographic or oscillographic determination of Ti in the presence of Fe, V, Cr, Ni and other metals, was developed. The mechanism of reduction of Ti complexes and the stability factors of tartrate, citrate and oxalate Ti complexes in 1-2 N sulfuric acid, are explained. An acid medium saturated with sodium oxalate was found to be most suitable for Ti determination. The effect of Fe, V, Cr, Ni and Mo on the magnitude of maximum Ti current, is elucidated. Eleven references: 6-USSR; 1-USA; 1-Belgian and 3-Czech (1932-1953). Tables; graphs; illustrations.

Institution : Acad. of Sc. USSR, The V. I. Vernadskiy Institute of Geochemistry and Analytical Chemistry, Moscow

Submitted : March 13, 1954

SINYAKOVA, S. I.

Complexons and their significance in analytical chemistry. S. I. Sinyakova (V. I. Vernadskii Inst. Geochem. and Anal. Chem., Acad. Sci. U.S.S.R., Moscow). *Zhur. Anal. Khim.* 10, 139–57; *J. Anal. Chem. U.S.S.R.* 10, 129–46(1955) (Engl. translation).—Complexons are defined as a group of complex-forming compds. extensively used in chemistry and particularly in analytical chemistry. The complexons are aminopolycarboxylic acids and their derivs. in which at least 2 AcOH residues are combined with N. The simplest of these compds. is iminodiacetic acid $HN(CH_2COOH)_2$. The use of these compds. in chem. analysis is reviewed. M. Hosch
147 references.



Polarographic catalytic current of molybdenum and its utilization in determination of microgram quantities of molybden...

75-13-2-5/27

AUTHORS: Sinyukova, S. I., Glinkina, M. I.

TITLE: Use of Complexones in Polarography (Primeneniye kompleksonov v polyarografii) Communication II. The Behavior of Molybdenum on a Dropping-Mercury Electrode in Complexones (Soobshcheniye 2. Povedeniye molibdena na rtutnom kapel'nom elektrode na fone kompleksonov)

PERIODICAL: Zhurnal Analiticheskoy Khimii, 1958, Vol. 13, Nr 2, pp. 186-192 (USSR)

ABSTRACT: In spite of numerous investigations (Refs 1 - 6) the mechanism of the electrode reactions of the molybdate ion is not yet explained. Above all there are up to now no clear data concerning the nature of the ions of molybdenum in the case of different pH-values. Many authors are of the opinion that the molybdate ion (MoO_4^{2-}) exists only in the case of pH-values $\geqslant 7$, whereas in solutions which are acid to a greater extent the ions $Mo_3O_{11}^{4-}$, $Mo_6O_{21}^{6-}$, $Mo_{12}O_{41}^{10-}$, and $Mo_{24}O_{78}^{12-}$ are formed. In the case of pH $\sim$ 1 molybdenum can

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Use of Complexones in Polarography. Communication II. The Behavior of Molybdenum on a Dropping-Mercury Electrode in Complexones

occur in the solution even as cation. Some investigations described in publications deal with the behavior of the molybdate ion on a dropping-mercury electrode in the presence of complex-forming substances (Refs 5, 8-11). In the present paper the results are given of examinations of the behavior of the complexes of molybdenum with the complexon I (nitrilotriacetic acid) and complexon III (di-sodium salt of the ethylene diamine tetraacetic acid), as well as with several new complexones in dependence on various factors (pH, concentration of the complexon, height of the mecury column, etc). Molybdenum yields with complexon I a well-marked reduction wave in acid solutions. The half-wave potential depends on the pH-value. In alkaline solutions (pH 8-10) no wave occurs which points to the instability of the complex in alkaline solutions. The optimun condition for the formation of the wave of molybdenum is a pH-value of from 4,5 - 5,5. The reduction of molybdenum takes a complicated course in presence of complexon I; in the case of certain pH-values intermediate stages develop. Since the amount of the diffusion current of molybdenum in the presence of complexon I depends to a great extent on the pH-

Use of Complexones in Polarography. Communication II. The Behavior of Molybdenum on a Dropping-Mercury Electrode in Complexones

-value of the solution, an application for quantitative determinations is not expedient. Also in the presence of complexon III the character of the polarograph of molybdenum depends to a great extent on the pH-value, on the concentration of the complexon III, and on other conditions. 0,065 was found to be the most favorable concentration of the complexon. In the investigation of the influence of the pH-value it was found that the wave vanishes in alkaline solution (pH > 8). The diffusion current increases with increasing pH-value (beginning with pH 2,5), and passes a maximum at pH 5,5. Then it decreases and reaches a value of 0 at a pH ~ 9. Therefore a pH of 5,5 is best suited for determinations. The limiting current obtained for molybdenum was found to be determined by the diffusion, since it depends on the height of the mercury column. The constant of the diffusion current of molybdenum changes with its concentration. It increases with decreasing concentration of molybdenum. In the case of a concentration of the latter of $1,5 \cdot 10^{-4}$ m the value of the constants of the diffusion

Use of Complexones in Polarography. Communication II. The Behavior of Molybdenum on a Dropping-Mercury Electrode in Complexones

current corresponds to a transition of 3 electrons, i.e. the reduction of Mo(VI) to Mo(III). In the investigation of the influence of external ions in the polarographic determination of molybdenum in the presence of complexon III it was found that Fe^{3+} and Cu^{2+} reduce the limiting current of molybdenum whereas the ions of Pb, Zn, V and W exercise practically no influence. The reduction of molybdenum in the presence of the di-sodium salt of benzhydrylamino acetic acid, furthermore in the presence of hexamethylenediamine tetraacetic acid and cyclohexane diamine tetraacetic acid was investigated, too. Summarizing it was found that molybdenum is in all cases reduced in acid solutions, whereas no reduction wave is formed in alkaline solutions. The half-wave potentials and the magnitudes of the diffusion currents of molybdenum are to a great extent dependent on the pH-value. It was found that complexon III gives the best results for analytical purposes. There are 9 figures, 5 tables, and 14 references, 6 of which are Soviet.

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75-13-2-5/27

Use of Complexones in Polarography. Communication II. The Behavior of Molybdenum on a Dropping-Mercury Electrode in Complexones

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo AN SSSR, Moskva
(Moscow Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, AS USSR)

SUBMITTED: May 27, 1956

1. Molybdenum ions--Chemical reactions 2. Acids--Chemical reactions
3. Mercury electrodes--Chemical effects 4. Polarographic analysis

Card 5/5

SINYAKOVA, S. I.

5(2) PHASE I BOOK EXPLOITATION SOV/3139

Kryukova, Tat'yana Aleksandrovna, Sof'ya Il'inichna Sinyakova, and Tat'yana Vasil'yevna Aref'yeva

Polyarograficheskiy analiz (Polarographic Analysis) Moscow, Goskhimizdat, 1959. 772 p. Errata slip inserted. 5,000 copies printed.

Ed.: G. Ye. Lur'ye; Tech. Ed.: Ye. G. Shpak.

PURPOSE: This book is intended for the staff of chemical research and analysis laboratories of scientific research institutes, schools of higher learning, and industrial enterprises.

COVERAGE: The book presents the theoretical and experimental principles of polarographic analysis and describes the construction of polarographs and the techniques of polarographic measurements. It describes polarographic analysis with dropping mercury electrodes, including amperometric titration, polarographic adsorption analysis, and oscilloscopic polarography. It also describes various methods for the determination of organic and inorganic cations and anions. The authors thank Professor

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Polarographic Analysis SOV/3139

B. N. Kabanov; Professor Yu. S. Lyalikov; E. S. Levin, Candidate of Chemical Sciences; and M. B. Bardin, Candidate of Chemical Sciences. Extensive bibliographies of Soviet and foreign literature accompany each chapter.

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SINYAKOVA S. I.

PARAMONOVSKIY, B.

PHASE I BOOK EXPLOITATION SOV/2216

5(4)

Soveshchaniye po elektrokhimii. 4th, Moscow, 1956.

Trudy...: (sbornik) (Transactions of the Fourth Conference on Electrochemistry; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 868 p. Errata slip inserted. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk.

Editorial Board: A.N. Frumkin (Resp. Ed.) Academician, O.A. Yesin, Professor; S.I. Zhdanov (Resp. Secretary), B.N. Kabanov, Professor; S.I. Zhdanov (Resp. Secretary); B.N. Kabanov, Professor; Ya. M. Kolotyrkin, Doctor of Chemical Sciences; V.V. Losev, P.D. Lukovtsev, Professor; Z.A. Solov'yeva; V.V. Stender, Professor; and G.M. Florianovich; Ed. of Publishing House: N.G. Yegorov; Tech. Ed.: T.A. Prusakova.

PURPOSE: This book is intended for chemical and electrical engineers, physicists, metallurgists and researchers interested in various aspects of electrochemistry.

COVERAGE: The book contains 127 of the 138 reports presented at the Fourth Conference on Electrochemistry sponsored by the Department of Chemical Sciences of Physical Chemistry, Academy of Sciences, USSR. The collection pertains to different branches of electrochemical kinetics, double layer theories and galvanic processes in metal electrodeposition and industrial electrolysis. Abridged discussions are given at the end of each division. The majority of reports not included here have been published in periodical literature. No personalities are mentioned. References are given at the end of most of the articles.

Card 9/34

Card 10/34

5(4) SOV/63-4-2-10/39

AUTHOR: Sinyakova, S.I., Candidate of Chemical Sciences

TITLE: The Development of the Polarographic Method of Analysis

PERIODICAL: Khimicheskaya nauka i promyshlennost', 1959, Vol 4, Nr 2, pp 197-207 (USSR)

ABSTRACT: The development of oscillographic polarography, the use of solid metal or amalgamated electrodes instead of the mercury droplet electrode has been caused by new branches of industry, like semiconductors, polymers, atomic energy, etc. Complex-forming organic reagents, non-aqueous solvents permit the combination of this method with extraction and chromatography. The mercury electrodes have been improved by the development of an electrode with continuously renewed surface [Ref 1], a droplet electrode with forced breaking-off of the droplet [Ref 2], etc. In the USSR Tsfasman [Ref 10] developed an apparatus with photographic recording, electronic devices and an apparatus for plotting curves. The new Czechoslovak polarograph LP-55 is of similar design. An oscillographic polarograph (Figure 4) has been developed by Gokhshteyn in the Institut geokhimii i analiticheskoy khimii imeni Vernadskogo AN SSSR (Institute of Geochemistry and Analytical Chemistry

Card 1/3

imeni Vernadskiy of the AS USSR). Heyrovsky and Forejt developed an a-c polarograph and a simplified portable device, called electronic polaroscope. Organic reagents, like oxyacids, are used to determine several elements in a solution [Ref 16], e.g. molybdenum in sodium tungstate on the base of sodium citrate. On this base also 0.1 γ/ml Nb may be determined. Salicylic acid, glyconic acid, complexon III or a combination of them show also good results [Ref 18, 23]. Tiron, i.e. pyrocatechin-3,5-disulfoacid, is used for the determination of Cu^{2+}, Pb^{2+}, Fe^{3+}, (Figure 5) [Ref 25], azo-dyes for the determination of aluminum and fluorides [Ref 29]. Titanium and niobium may be determined in a 70%-solution of H_2SO_4 [Ref 32], other elements in metallic calcium [Ref 35]. Polyvalent cations of catalytic currents are used in the analysis of very small quantities e.g. 10^{-6}-10^{-7}% [Ref 42]. Uranium in 1-2 M solutions of HCl and H_2SO_4 is also determined by catalytic currents [Ref 43]. The reduction of anions on the mercury droplet electrode has been studied by Frumkin [Ref 47]. Polarographic methods have been developed for the determination of elementary sulfur in petroleum, gasoline, etc [Ref 48]. The electrode reactions of halides have been investigated, e.g. chlorides in the air of industrial plants. The determination of nitrates and nitrites by polarographic methods [Ref 61] is used in automatic pro-

duction control of the metallurgical, chemical and atomic industry [Ref 62]. Stromberg developed the theory of amalgam polarography [Ref 64]. Organic compounds are more easily reduced if they have conjugated double bonds. The relation of their reduction to the value of their dipole moments have been investigated [Ref 66]. A relation between the shift E 1/2 and the nuclear magnetic resonance, the pH value and the diffusion coefficient has been found [Ref 69]. Methods for the determination of anthracene, carbazol, diphenyloxide, etc in coal tar have been proposed [Ref 75]. Soviet scientists investigated aromatic and aliphatic halide derivatives [Ref 78], nitrocompounds [Ref 80], disulfide and mercaptans in petroleum fractions [Ref 84]. Zuman studied many sulfur-containing compounds [Ref 87]. The reduction of organic acids and esters, the kinetics of polymerization processes, etc has been studied by means of oscillographic polarography [Ref 90, 91].

There are 2 diagrams, 5 graphs and 105 references, 50 of which are Soviet, 19 Czechoslovakian, 18 English, 8 German, 4 American, 2 Japanese, 1 Polish, 1 Swiss, 1 Italian and 1 French.

5(2)
AUTHORS: Sinyakova, S. I., Klassova, N. S. SOV/78-4-9-12/44

TITLE: The Absorption Spectra of the Uranyl Nitrate in Organic Solvents

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 9, pp 2000-2008 (USSR)

ABSTRACT: The present investigation was concluded in 1954. The determination of the optical density of the solutions was carried out by means of an SF-11 spectrophotometer. To begin with, the absorption was measured in the following aqueous solutions: in dilute hydrochloric acid, in saturated ammonium nitrate solution, in 4% ortho-phosphoric acid, and in 10% sulfuric acid (Fig 2). With the exception of the hydrochloric acid solution all solutions showed an absorption maximum at 410 - 425 mμ. Thus, a complex is evidently not formed in dilute hydrochloric acid. The molar absorption coefficients are very small (5 - 15). For this reason the absorption spectra of uranyl nitrate were measured in organic solvents (diethyl ether, ethyl acetate, acetoacetic ester, ortho-formic ester, dioxane, methyl-ethyl ketone, methyl-propyl ketone, methyl-butyl ketone, cyclohexanone, butyl alcohol, tri-n-butyl phosphate, xylene, and cyclohexane)(Figs 3, 4). Light absorption

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was highest in acetoacetic ester. In all ketonic solvents the absorption maximum lay at 450 mμ. The value for the molar absorption coefficient ε decreases with a rising C/O proportion (Fig 5). In butyl alcohol (Fig 6) the absorption curve between 375 - 400 mμ is horizontal, and at 316 mμ rises to 100%. In dioxane the spectrum is similar (Fig 7). It was not possible to extract uranyl nitrate with cyclohexane and xylene. The molar absorption coefficient varies between 10 and 20 in the majority of the organic solvents investigated. Divergent values were obtained for mixtures of solvents, e.g. 45 for methyl ethyl ketone - ethyl acetate (1:1), 180 for the acetoacetic ester fraction distilling at 170 - 183°. This fraction might thus be employed as solvent for the spectroscopic determination of small amounts of uranium. However, the influence of Fe^{III} which forms colored compounds with this ester, and the inhibitory influence of other elements (Ti,V,Mo) on the extraction (Table 3) would first have to be eliminated by addition of masking, complex forming substances. The authors thank A. P. Vinogradov for his advice. There are 9 figures, 3 tables, and 21 references, 4 of which are Soviet.

SUBMITTED: May 14, 1958

Card 2/2

5 (2), 5 (3)

AUTHORS: Sinyakova, S. I., Klassova, N. S.

SOV/75-14-4-12/30

TITLE: Spectrophotometric Investigation of Uranium Solutions. Communication 2. A Spectrophotometric Method for the Determination of Uranium in Ores and Other Materials, As Thiocyanate, After the Extraction With Methylethyl Ketone

PERIODICAL: Zhurnal analiticheskoy khimii, 1959, Vol 14, Nr 4, pp 451-456 (USSR)

ABSTRACT: The determination method proposed in the paper is based on the fact that uranium is extracted as a nitrate with the help of methylethyl ketone, whereby the major part of the accompanying elements is separated. The photometric determination of uranium is then carried out immediately in the organic phase, after adding ammonium thiocyanate. The determination is thereby accelerated and simplified. Methylethyl ketone is specially suitable for the extraction since the distribution coefficient of uranyl nitrate in this reagent (K=21) is greater than in other organic solvents (Ref 1). The measurement of the optical densities was carried out on the spectrophotometer SF-11. Methylethyl ketone or a mixture of water and acetone, which contained the reagents in the same concentration as the sample solution, were used as a comparative solution. The authors investigated the

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Spectrophotometric Investigation of Uranium Solutions. Communication 2. A Spectrophotometric Method for the Determination of Uranium in Ores and Other Materials, As Thiocyanate, After the Extraction With Methylethyl Ketone SOV/75-14-4-12/30

influence exerted by the elements iron, copper, aluminum, titanium, vanadium, and molybdenum on the light absorption of the uranium-thiocyanate complex in aqueous acetone (60 % by volume of acetone) as a medium. Small amounts of iron and copper are of no importance if the determination is carried out at 350 mμ. Aluminum, even in great amounts, does not disturb the proposed determination of uranium. Aqueous acetone can therefore be used as a medium for an exact spectrophotometric determination of uranium in the form of a thiocyanate complex, after the separation of a number of disturbing elements. The elimination of the disturbing influence of several elements which can be extracted by methylethyl ketone, is described in the paper in detail. Conditions of the spectrophotometric determination of uranium in the form of a thiocyanate complex were worked out with the help of samples containing Fe, Cu, Co, V, Mo, and other elements. According to the foreign ions present, 4 variations of this method are proposed, which are described in detail. The method permits the determination of 0.01-1.0 % of uranium in ores

Card ~~2/4~~ 2/3

Spectrophotometric Investigation of Uranium Solutions. SOV/75-14-4-12/30
Communication 2. A Spectrophotometric Method for the Determination of Uranium in Ores and Other Materials, As Thiocyanate, After the Extraction With Methylethyl Ketone

and other materials. The relative error of the determination is ± 2-3 %. Table 1 shows the results of the spectrophotometric determination of uranium in the form of a thiocyanate complex, after extraction by methylethyl ketone from solutions which contained various foreign ions (Fe, Cu, Co, Mo, Zr, V) and, for their elimination, various masking substances (ascorbic acid, lactic acid, zirconium nitrate). The results of the determination of uranium in 6 ore samples are shown in table 2. (P. N. Paley delivered a short report on this material at the Geneva Conference 1955). There are 4 figures, 2 tables, and 20 references, 6 of which are Soviet.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo AN SSSR, Moskva (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences, USSR, Moscow)

Card 3/4

SINYAKOVA, S. I.

AUTHOR: Bilimovich, G. N. SOV/75-14-4-30/30

TITLE: Section of Analytical Chemistry of the VIII Mendeleyev Congress on General and Applied Chemistry

PERIODICAL: Zhurnal analiticheskoy khimii, 1959, Vol 14, Nr 4, pp 511-512 (USSR)

ABSTRACT: Approximately 300 persons participated in the work of the Department of Analytical Chemistry, among them representatives of various scientific research institutes, higher schools and industrial enterprises in Russia, scientists from China, Bulgaria, the ČSR, Poland, Hungary, and Italy. Approximately 70 reports were heard. In his opening speech I. P. Alimarin reported on the achieved results and on modern problems of analytical chemistry. I. V. Tananayev reported on the application of physico-chemical analysis in heterogeneous systems for the solution of a series of problems of analytical chemistry. V. I. Kuznetsov reported on modern aims in the use of organic reagents; A. K. Babko showed at the example of halide and thiocyanate complexes the correlation between the stability of complexes and the position of the corresponding central atoms in the periodic system. V. M. Peshkova and V. M. Bochkova lectured on the stability of oximates of Cu, Co, and Ni as depending on the structure of the oxime molecule. V. V. Toropova lectured on the double character of reaction of some compounds in the formation of complexes. The problem of the application of heteropolyacids in analytical chemistry was dealt with in the lectures of Z. F. Shakhova and co-workers, and A. I. Kokorin and N. A. Polotebnova. A large number of lectures dealt with the use of new organic reagents in analysis: A. I. Busev and M. I. Ivanyutin reported on the application of dialkyl and diaryl dithiophosphoric acid for the separation of elements, A. I. Portnov used aryl arsonic acid and aryl phosphinic acid. R. P. Lastovskiy and his co-workers treated some properties of new complexons. The lectures of V. A. Nazarenko, G. G. Shitareva and A. I. Kononenko dealt with the photometric determination of a series of elements using fluorine derivates. A. I. Cherkesov lectured on the use of halochromation in analytical chemistry. B. M. Dobkina and T. M. Malyutina lectured on the determination of tantalum using differential spectrophotometry. Yu. V. Morachevskiy and L. A. Stolyarova reported on new highly sensitive analysis methods using an ultraviolet microscope. Several lectures dealt with methodical and theoretical problems of spectrum analysis (N. F. Zakhariy and G. A. Sheynin; E. Ye. Vaynshteyn and co-workers). N. S. Poluektov and M. N. Nikonova treated the perfection of flame photometry. Several lectures dealt with the determination of elements by polarography (S. I. Sinyakova; Z. B. Rozhdestvenskaya and I. A. Yarovoy; Ye. F. Gokhshteyn). New results in using fixed electrodes were reported by I. D. Panchenko and Yu. S. Lyalikov and co-workers. The lecture of N. I. Udal'tsova and P. N. Paley treated the use of amperometric titration with two electrodes in the chemistry of uranium and thorium. M. M. Senyavin showed possibilities of predicting the conditions of chromatographic separation of elements based on their position in the periodic system. T. A. Belyavskaya reported on the use of ion exchange in the investigation of the state of substances in solutions. A. S. Vernidub and V. I. Petrashen' lectured on the chromatographic separation of a series of elements, N. G. Polyanskiy reported on adapting the properties of ion exchanger resins, F. M. Shemyakin and associates reported on the chromatographic proof of sulfanilamide preparations in liquids of the organism. G. L. Starobinets and associates treated the application of high polymers in chromatographic analysis. The lecture of A. A. Zhukhovitskiy and N. M. Turkel'taub, G. Shay dealt with gas chromatography. Several lectures treated the use of radioactive isotopes for the chromatographic investigation of complex formation (D. I. Ryabchikov and associates), for the investigation of the co-precipitation mechanism of ions of rare metals with sulfides (N. A. Rudnev) and for determining rare elements by means of isotope dilution (I. P. Alimarin, G. N. Bilimovich). In the field of elementary organic microanalysis the lectures of M. O. Korshun, E. E. Gel'man and V. A. Klimova with associates have to be mentioned, who treated the elaboration of rapid micromethods for the simultaneous determination of several elements from one weighed portion of boron, fluorine and silicium-organic compounds.

Card 1/4

Card 2/4

Card 3/4

SINYAKOVA, S.I.

Use of organic reagents in polarography. Trudy kom. anal. khim. 11:361-388 '60. (MIRA 13:10)

1. Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo AN SSSR.
(Polarography) (Chemical tests and reagents)

SINYAKOVA, S.I.

PHASE I BOOK EXPLOITATION SOV/4443

Akademiya nauk SSSR. Komissiya po analiticheskoy khimii

Metody opredeleniya primesey v chistykh metallakh (Methods of Determining Admixtures In Pure Metals) Moscow, 1960. 411 p. (Series: Its: Trudy, 12) 3,500 copies printed.

Resp. Eds.: A.P. Vinogradov, Academician, and D.I. Ryabchikov, Doctor of Chemical Sciences; Ed. of Publishing House: M.P. Volynets; Tech. Ed.: T.V. Polyakova.

PURPOSE: This collection of articles is intended for chemists, metallurgists, and engineers.

COVERAGE: The articles describe methods for detecting and determining various admixtures and their traces in pure metals. Also discussed are many chemical, physicochemical, electrochemical, spectrochemical and luminescence methods of analyzing materials of high purity. The editors state that these methods have been developed within the last five or six years by various Soviet scientific institutes, and are now widely used in research and factory laboratories of the Soviet Union. No personalities are mentioned. References, mostly Soviet, accompany each article.

SINYAKOVA, S.I.; CHEN' YUY-VEY [Ch'en Yü-wei]

Polarographic determination of calcium in lepidolites and muscovites. Zhur.anal.khim. 15 no.3:277-280 My-Je '60. (MIRA 13:7)

1. V.I.Vernadsky Institute of Geochemistry and Analytical Chemistry, Academy of Sciences, U.S.S.R., Moscow.
(Calcium--Analysis) (Lepidolite)
(Muscovite)

SINYAKOVA, S., kand.khim.nauk

Procedures used in polarographic analysis. Tekh.mol. 28 no.2:4 '60. (MIRA 13:6)
(Czechoslovakia--Polarography)

S/075/61/016/001/006/019
B013/B055

AUTHORS: Sinyakova, S. I., Rudnev, N. A., Shen' Yuy-chi, and Dzhumayev, R.

TITLE: Polarographic Determination of Indium in Metallic Gallium

PERIODICAL: Zhurnal analiticheskoy khimii, 1961, Vol. 16, No. 1, pp. 32-35

TEXT: In the present paper, the authors worked out experimental conditions for the polarographic determination of 10^{-5} - 10^{-6}% indium and procedures for its separation and enrichment in the analysis of metallic gallium. 0.2 M HCl was used as background for the polarographic analysis. In this solution the diffusion current is directly proportional to the indium concentration in the range $2 \cdot 10^{-6}$ - $4 \cdot 10^{-5}$ M (Fig. 1). The lowest determinable concentration of indium is $2 \cdot 10^{-6}$ M. The possibility of determining indium in the oscillographic polarograph of the GEOKhI (model 2) was checked. Oscillograms of indium in 0.2 M HCl and the dependence of the height of the peak on the concentration of indium in the solu-

Card 1/3

tion are represented in Fig. 2. It was found that in 2-g samples, $1 \cdot 10^{-5}$% In can be determined polarographically, provided the final volume of the solution does not exceed 1 ml. The oscillographic method permits determination down to $2.5 \cdot 10^{-6}$% In. The indium contained in gallium requires concentration before it can be determined. For this, the authors suggest the following procedure: First indium is co-precipitated with cobalt sulfide. Fig. 3 shows the curve characterizing the co-precipitation of 1 γ indium with varying amounts of cobalt. Precipitation of 0.1 γ indium by 10 - 15 mg cobalt yields in the average 93%. Then indium is separated from still present gallium and the sulfate ions by extraction in the form of dithizone with CCl_4 in the presence of sulfosalicylic acid or as bromide or chloride by extraction with diisopropyl ether (Tab. 1). Of various masking agents, sulfosalicylic acid proved to be the most suitable for masking gallium during dithizone extraction of indium at pH 4.8 - 5.2 (Ref. 9). The latter pH was found to be optimal for the quantitative extraction of indium in the presence of sulfosalicylic acid (Fig. 4). Finally the indium content is determined polarographically by using a calibra-

Polarographic Determination of Indium in Metallic Gallium

S/075/61/016/001/006/019
B013/B055

tion curve (Fig. 1). The results obtained for indium determinations in very pure gallium appear in Tab. 2. The relative error in determination of 0.2 - 1.0 γ indium, which corresponds to 10^{-5} - 10^{-6}%, did not exceed 15%. The authors thank I. P. Alimarin for valuable advice. There are 4 figures, 2 tables, and 11 references: 8 Soviet and 3 Czechoslovakian.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo AN SSSR, Moskva (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences USSR, Moscow)

SUBMITTED: February 23, 1960

Card 3/3

SINYAKOVA, S.I.; MARKOVA, I.V.

Determination of the ultrasmall Pb, Cu, and Zn content of alkalies and acids with the aid of amalgam polarography on a stationary mercury drop. Zav.lab. 27 no.5:521-525 '61. (MIRA 14:5)

1. Institut geokhimii i analiticheskoy khimii imeni V. I. Vernadskogo Akademii nauk SSSR.

(Lead--Analysis)
(Copper--Analysis)
(Zn--Analysis)

UDAL'TSOVA, N.I.; SAVVIN, S.B.; NEMODRUK, A.A.; NOVIKOV, Yu.P.; DOBROLYUBSKAYA, T.S.; ~~SINYAKOVA, S.I.;~~ BILIMOVICH, G.N.; SERDYUKOVA, A.S.; BELYAYEV, Yu.I.; YAKOVLEV, Yu.V.; NEMODRUK, A.A.; CHMUTOVA, M.K.; GUSEV, N.I.; PALEY, P.N.; VINOGRADOV, A.P., akademik, glav. red.; ALIMARIN, I.P., red.; BABKO, A.K., red.; BUSEV, A.I., red.; VAYNSHTEYN, E.Ye., red.; YERMAKOV, A.N., red.; KUZNETSOV, V.I., red.; RYABCHIKOV, D.I., red. toma; TANANAYEV, I.V., red.; CHERNIKHOV, Yu.A., red.; SENYAVIN, M.M., red. toma; VOLYNETS, M.P., red.; NOVICHKOVA, N.D., tekhn. red.; GUS'KOVA, O.M., tekhn. red.

[Analytical chemistry of uranium] Analiticheskaia khimiia urana. Moskva, Izd-vo Akad.nauk SSSR, 1962. 430 p. (MIRA 15:7)

1. Akademiya nauk SSSR. Institut geokhimii i analiticheskoy khimii.

(Uranium—Analysis)

S/137/62/000/012/083/085
A006/A101

AUTHORS: Sinyakova, S. I., Yu-ch'ih Shen

TITLE: Polarographical determination of ultra-small metal quantities with a stationary mercury electrode

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 12, 1962, 16, abstract 12K100 (In collection: "Teoriya i praktika polyarogr. analiza", Kishinev, "Shtinitsa" 1962, 151 - 158)

TEXT: The authors investigated the effect of various factors upon the quantitative determination of some elements, in concentrations between 10^{-7} and 10^{-8} moles, using a "lying" Hg drop as an electrode. The circuit of the cell employed and of the relay for the formation of a Hg drop with a constant surface, are given. It is shown that multiple determination of Pb, In and Cd can be made with the same solution, if the Hg drop is restored for each measurement. This makes it possible to use the method of admixtures in quantitative measurements. Pb in concentrations down to 10^{-8} moles can be determined with ± 6% accuracy in the presence of a 10-fold content of Cu, Cd, and Zn; In can be determined in

Card 2, Card 1/2

SINYAKOVA, S.I.; VASIL'YEV, Yu.I.

Present state of the polarographic method for determining the ultramicroimpurities by means of electrolytic accumulation on mercury and solid electrodes with the subsequent dissolution of mixtures. Metod. anal. khim. reak. i prepar. no.5/6:5-15 '63. (MIRA 17:9)

1. Institut geokhimii i analiticheskoy khimii imeni V.I. Vernadskogo AN SSSR i Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv.

SEMYAKOVA, I.V.; NAZKOVA, L.V.

Determination of zinc, lead, and copper impurities in caustic hydroxides. Metod. anal. khim. reak. i prepar. no.5/6:[illegible]

Determination of zinc, lead, and copper impurities in inorg. anal. acids. Ibid.:54-57 (MIRA 17:9)

1. Institut geokhimii i analiticheskoy khimii imeni V.I. Vernadskogo AN SSSR.

L 28713-65 EWT(m)/EWG(m)/T/EWP(t)/EWP(b) IJP(c) JD/RWH

ACCESSION NR: AT5004072 S/3127/63/000/05-/0058/0062

AUTHOR: Sinyakova, S. I., Dudareva, A. G., Markova, I. V., Talalayeva, I. N.

TITLE: Determination of zinc, cadmium, lead, and copper impurities in indium and its salts

SOURCE: USSR. Gosudarstvennyy komitet po khimii. Metody analiza khimicheskikh reaktivov i preparatov, no. 5/6, 1963. Polyarograficheskoye opredeleniye ul'tramikroprimesey s nakopleniyem ikh na statsionarnykh rtutnykh ili tverdykh elektrodakh s posleduyushchim rastvoreniyem (Polarographic determination of ultramicro-impurities with their accumulation on stationary mercury or solid electrodes and subsequent dissolution), 58-62

TOPIC TAGS: indium analysis, indium refining, zinc determination, cadmium determination, lead determination, copper determination, amalgam polarography, mercury cathode

ABSTRACT: The method is based on the separation of indium by extraction with diisopropyl ether from a solution of hydrobromic acid followed by a determination of the impurities by the amalgam polarographic technique with their electrolytic accumulation on a stationary mercury cathode. The apparatus, reagents, and solutions employed are listed, and the determination procedure is described. The content of the impurities present in indium as determined by the method of additions is calculated by means of the formula

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ACCESSION NR: AT5004072

$$\% = \frac{C \cdot h_1 \cdot v_1 \times 100 \times 10^{-6}}{(h_2 - h_1) v_2 \cdot g}$$

where h_1 is the depth of the anode peak of the investigated solution, in mm; h_2 is the depth of the anode peak after the introduction of a standard solution of the impurity, in mm; C is the concentration of the impurity due to the addition, in μg/ml; v_1 is the volume of the solution being analyzed, in ml; v_2 is the volume of the solution after the introduction of the addition, in ml; and g is the weight of the sample in grams. The accuracy of the method varies between ± 3% and ± 15% depending upon the content of impurities. Orig. art. has: 3 figures, 1 table, and 1 formula.

ASSOCIATION: GEOKhI

SUBMITTED: 00Dec62 ENCL: 00 SUB CODE: IC, MM

NO REF SOV: 003 OTHER: 001

Card 2/2

S/075/63/018/003/003/006
E071/E436

AUTHORS: Sinyakova, S.I., Dudareva, A.G., Markova, I.V., Talalayeva, I.N.

TITLE: Determination of copper, lead, cadmium and zinc impurities in particular pure indium and its salts by the method of amalgam polarography with a stationary electrode

PERIODICAL: Zhurnal analiticheskoy khimii, v.18, no.3, 1963, 377-384

TEXT: A method of amalgam polarography with a stationary electrode (mercury drop) was developed for the determination of zinc, cadmium, lead and copper impurities at concentrations down to 10^{-6}% in metallic indium and its salts. The method is based on the extraction of indium (as bromide) with di-isopropyl ether from 5 M HBr. After concentrating the impurities in the mercury drop by electrolysis at a controlled potential from potassium (sodium) hydroxide and HCl solutions, they are determined from the curves of anodic dissolution of the metals from the amalgam at a continuously changing potential. Since indium is not completely removed by the extraction, the effect of additions of complexone III, sodium

Card 1/2

Determination of copper ...

acetate and sodium tartrate on the shift of the indium wave to more negative potentials was investigated by the method of oscillographic polarography. The method was tested on a number of samples of metallic indium and indium iodide with satisfactory results. The maximum error does not exceed ± 15%. There are 6 figures and 4 tables.

ASSOCIATIONS: Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo AN SSSR (Institute of Geochemistry and Analytical Chemistry imeni V.I.Vernadskiy AS USSR)
Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V.Lomonosova (Moscow Institute of Fine Chemical Technology imeni M.V.Lomonosov)

SUBMITTED: June 26, 1962

L 21143-65 EPF(n)-2/EWT(m)/EWP(b)/EWP(t) Pu-4 IJP(c)/SSD/AFWL/AFETR
JD/JG

ACCESSION NR: AP5001461 S/0075/64/019/012/1434/1441

AUTHOR: Bikbulatova, R. U.; Sinyakova, S. I. B

TITLE: Catalytic polarographic currents I. Determination of microquantities of molybdenum in high-purity indium by means of a catalytic wave of nitrate ions 27 14 27

SOURCE: Zhurnal analiticheskoy khimii, v. 19, no. 12, 1964, 1434-1441

TOPIC TAGS: polarographic analysis, catalytic polarography, indium, indium chemical analysis, high purity indium, molybdenum determination, trace analysis

ABSTRACT: A catalytic wave of nitrate ions in sulphuric acid solutions containing microquantities of ammonium molybdate has been studied in order to optimize conditions for the polarographic determination of molybdenum in high-purity indium metal. The study was prompted by the absence of a clear interpretation of the generation of polarographic current in the presence of molybdenum catalyst and by the unreliability of existing data on the sensitivity of molybdenum

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L 21143-65

ACCESSION NR: AP5001461

determination by the catalytic-current method. An LP-55 polarograph with saturated calomel anode was used for measurements. The effect of the concentration of H_2SO_4 and KNO_3 on the value of i_{cat} of NO_3^- ions was established. With increasing H_2SO_4 concentration up to 5 M, i_{cat} decreased, but i_{cat} increased with increasing NO_3^- concentration up to 2 M (the limiting value). It was found that the value of the nitrate current does not depend on the mercury pressure above the capillary tube. The temperature and molybdenum (VI) concentration dependence of the i_{cat} were linear. It was shown that the temperature factor of the catalytic current is 6.8—9% per deg C within the temperature range from 25 to 70C. It was established that molybdenum concentrations down to 5×10^{-8} M can be determined by the catalytic nitrate current when solutions are polarographed at 45C, and down to 1×10^{-7} M, when they are polarographed at 25C. The influence of In (III), W (VI), Cu (II), Fe (III), and Cr (VI) on the value of the limiting nitrate current in the presence of molybdenum was demonstrated. The maximum permissible metal/Mo ratios were determined for three metals. Indium started to interfere with Mo determination at ~ 300,000/1 ratio. A method was suggested for the determination

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ACCESSION NR: AP5001461

of molybdenum in indium by the catalytic wave of nitrate ions without the separation of indium. The method permits the determination down to 5×10^{-6}% Mo from a 0.5-g indium sample. The accuracy is from ±2 to ±19%, depending on the molybdenum content. Orig. art. has: 5 tables and 5 figures.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. Vernadskogo AN SSSR, Moscow (Institute of Geochemistry and Analytical Chemistry, AN SSSR)

SUBMITTED: 28Feb64 ENCL: 00 SUB CODE: IC, OP

NO REF SOV: 008 OTHER: 005 ATD PRESS: 3165

Card 3/3

SINYAKOVA, S. I. Moscow

"Amalgampolarographische Spurenbestimmung in Reinstoffen mit Voranreicherung und Anwendung katalytischer Strome."

report submitted for 2nd Intl Symp on Hyperpure Materials in Science and Technology, Dresden, GDR, 28 Sep-2 Oct 65.

Institut geokhimii i analiticheskoy khimii im Vernadskig Akademii nauk SSSR, Moscow.

L 52288-65 EWT(m)/EWG(m)/T/EWP(t)/EWP(b) IJP(c) RWH/JD

ACCESSION NR: AT5012677 UR/2513/65/015/000/0164/0174 19 18 81

AUTHOR: Sinyakova, S.I.; Markova, I.V.; Galfayan, N.G.

TITLE: Electrolytic concentration of trace amounts of lead and copper at a stationary mercury electrode and their determination from catalytic currents

SOURCE: AN SSSR. Komissiya po analiticheskoy khimii. Trudy, v. 15, 1965. Metody kontsentrirovaniya veshchestv v analiticheskoy khimii (Methods of concentrating substances in analytical chemistry), 164-174

TOPIC TAGS: electrolytic concentration, lead determination, copper determination, mercury electrode, catalytic current

ABSTRACT: A study was made of the electrochemical accumulation of lead and copper impurities in a stationary mercury electrode and their subsequent determination by means of the catalytic currents arising from the dissolution of the amalgam at a steadily changing potential in neutral KCl solutions containing oxygen or H_2O_2. The influence of lead and copper ions, duration of preelectrolysis, concentration of oxygen and of the catalyst ion, temperature, and other factors on the magnitude of the catalytic current of H_2O_2 was studied. It was shown that the maximum potential of lead

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L 52288-65

ACCESSION NR: AT5012677

(E_{max} Pb) is equal to -0.41 V and that E_{max} Cu = -0.18 V relative to the saturated calomel electrode, and that the magnitude of the catalytic currents depends linearly on the lead and copper concentration of the solution, with a 25% maximum deviation at copper concentrations equal to 5 x 10-9 M and lead concentrations of 5 x 10^{-10} to 1 x 10^{-9} M. The magnitude of the catalytic current of H_2O_2 was found to depend on the ratio of the concentration of the metal ions to the concentration of hydrogen in the solution. A possible mechanism for the formation of this current is proposed. Orig. art. has: 6 figures, 4 formulas and 3 tables.

ASSOCIATION: Komissiya po analiticheskoy khimii, AN SSSR (Commission on Analytical Chemistry, AN SSSR)

SUBMITTED: 00 ENCL: 00 SUB CODE: IC, GC

NO REF SOV: 007 OTHER: 005

Card 2/2

SINYAKOVA, V.M.

Chemical control of susliks. Zashch. rast. ot vred. i bol. 5 no.4:23 Ap '60. (MIRA 13:9)

1. Agronom po zashchite rasteniy Perevolotskoy rayonnoy traktornoy stantsii, Orenburgskoy oblasti.
(Susliks--Extermination)

VAL'TER, L. YA.: NEMETS, S.N.: SINYAKOVA, Z.N.

Fishery Products - Analysis

Vitamin content in canned fish. Ryb. khoz., 28, No. 5, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952, UNCLASSIFIED

Sinyakova, S. I.

Category: USSR/Analytical Chemistry - Analysis of inorganic substances. G-2

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 30997

Author : Sinyakova S. I., Glinkina M. I.
Inst : not given
Title : Polarographic Catalytic Molybdenum Current and Its Utilization for Determination of Microgram-Amounts of Molybdenum.

Orig Pub: Zh. analit. khimii, 1956, 11, No 5, 544-552

Abstract: Study of the catalytic wave (CW) of Mo with a background of 1 M $HClO_4$ - 0.75 M H_2SO_4 and 1 M $NaClO_4$ - 0.75 M H_2SO_4. It was ascertained that in these media the Mo current does not depend on mercury-column pressure and H_2SO_4 concentration, but depends on concentration of $HClO_4$ (or $NaClO_4$) and is due to oxidation of Mo(4+), which is formed as a result of electrode reduction of Mo(5+) by the perchloric acid. The possibility is shown of determining the Mo on the basis of the CW, at concentrations up to $1 \cdot 10^{-4}$ M, with a relative error not exceeding $\pm$ 10%.

Card : 1/2

SINYAKOVAYA, S. I.

"A survey of the application of kinetic catalytic currents in polarography for the determination of very small quantities of several elements."

submitted at the Conference on Kinetic Methods of Analysis, Ivanovo, 14-16 June 1960

So: Izvestiya Vysshikh Uchebnykh Zavedeniy SSSR, Khimiya i Khimicheskaya Technologiya, Vol III, No 6 Ivanovo, 1960. pages 1113-1116.

LUPINOVICH, I.S., akademik; SHKLYAR, A.Kh., dotsent; SINYAKOVICH, G.A., red.; LAZAREVA, M., tekhred.

[Through the White Russian Polesye; geographical sketches] Po Belorusskomu Poles'iu; geograficheskie ocherki. Minsk, Belorusskii gos.univ., 1958. 100 p. (MIRA 12:4)

1. Akademiya nauk BSSR (for Lupinovich).
(Polesye)

SINYAKOVICH, G.A.

SIINYAKOVICH, Georgiy [Siniakovich, Heorhi]

"Daughter of Russia"; a tale by P. Cherednichenko. Reviewed by Heorhi Siniakovich. Rab.i sial. 35 no.3:10 Mr '59. (MIRA 12:3)
(Cherednichenko, Petr Evstaf'evich, 1903-)

SINYAKOVICH, Georgiy Antonovich; YAZYLETS, N.M., red.; ZIMA, Ye.G., tekhn. red.

[Crustal salt; comments on the construction of Šoligorsk]Sol' zemli; ocherki o Soligorskoi stroike. Minsk, 1962. 30 p. (Obshchestvo po rasprostraneniiu politicheskikh i nauchnykh znanii Belorusskoi SSR, no.24) (MIRA 16:1)

(Soligorsk--City planning)
(Starobin District--Potassium salts)

KUZNETSOV, V.A.; SINYANSKAYA, R.I.; PORTNAYA, G.N.; VOLYNSKAYA, M.P.

Electrocapillary phenomena in Te-Ag alloys and surface tension of these alloys in a vacuum. Izv.vys.ucheb.zav.;khim.i khim.tekh. 5 no.3:428-432 '62. (MIRA 15:7)

1. Ural'skiy gosudarstvennyy universitet imeni A.M. Gor'kogo, kafedra fizicheskoy khimii.
(Tellurium-silver alloys)
(Surface tension)
(Electrocapillary phenomena)

L 51446-65 EWT(d)/EWT(m)/EWP(w)/EPF(c)/EWP(i)/EWA(d)/EWP(v)/EPR/EWP(j)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c) Pc-4/Pf-4/Pr-4/Ps-4 IJP(c) JD/HM/NW/EM/RM

ACCESSION NR: AP5009673 UR/0135/65/000/004/0022/0025
621.791.763.1:668.395:624.014.25

60
59
B

AUTHOR: Rubanovich, B.B. (Engineer); Itskovich, A. A. (Engineer); Sinyakovskiy, V. A. (Engineer)

TITLE: Spot welding of glued structural panels

SOURCE: Svarochnoye proizvodstvo, no. 4, 1965, 22-25

TOPIC TAGS: structural sandwich panel, aluminum clad panel, glued panel welding, weld joint, epoxy glue / EPTs adhesive

ABSTRACT: The authors selected cold-curing EPTs adhesive (by weight: 100 parts epoxy resin ED-5 or ED-6, 20 parts polyester MGF-9 or TGM-3, 25 parts hexamethylene diamine residues as hardener and 50 parts cement as filler) and optimal welding process criteria (current 4 - 6% lower, clamping pressure 12 - 18% higher, preclamping period at least 0.5 sec, etc.) for spot welding of glued sandwich panels (Al-Mg alloys over plastic fillers). The static crack strength of glued-welded joints and the strength of glued-welded structural sandwich panels were 50% higher than without the adhesive. Orig. art. has: 4 figures and 2 tables.

Card 1/2

L 51448-65

ACCESSION NR: AP5009673

ASSOCIATION: TsNIISK Gosstroya SSSR

SUBMITTED: 00 ENCL: 00 SUB CODE: IE, MT

NO REF SOV: 004 OTHER: 000

Card 2/2

L 2299-66 EWP(e)/EWT(m)/EPF(c)/EWP(i)/EWP(v)/EWP(j)/T/EWP(t)/EWP(k)/EWP(b)/
EWA(c) JD/WW/HM/RM/WH
ACCESSION NR: AP5020166 UR/0135/65/000/008/0033/0034
621.791.039

AUTHORS: Itskovich, A. A. (Engineer); Sinyakovskiy, V. A. (Engineer); Rubanovich, B. B. (Engineer)

TITLE: Apparatus for preparation of aluminum alloy surfaces for adhesive-welded connections

SOURCE: Svarochnoye proizvodstvo, no. 8, 1965, 33-34

TOPIC TAGS: metal bonding, welding, adhesive bonding, surface finish, surface preparation

ABSTRACT: Since bonded joint quality depends to a large extent on the preparation of the bonded surfaces, an optimum chemical or mechanical surface preparation method should be used for each bonding method. For mechanical surface preparation small steel wire brushes (wire diameter 0.2 mm, outside diameter 100 mm, inside diameter 30-40 mm, width 8-15 mm, speed 1200-3000 rpm) are recommended for best results. The authors developed a simple apparatus for cleaning large construction parts (up to 6 m long) at a speed of up to 2.5 m/min. It consists of a 1 kw, 930 rpm motor with a 250-mm long horizontal pendulum lever pivoted on the motor axis.

Card 1/2

L 2299-66

ACCESSION NR: AP5020166

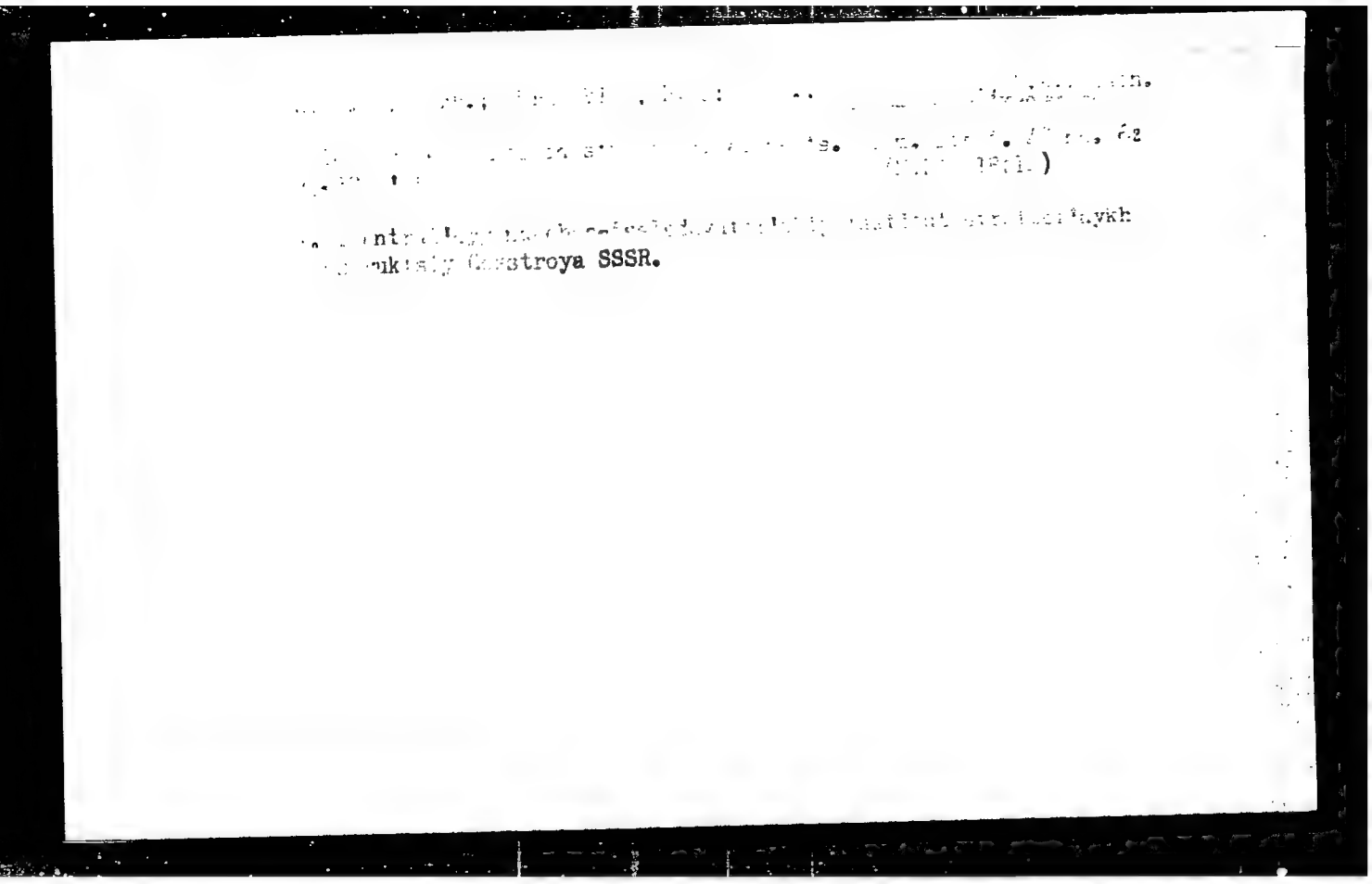
The end removed from the motor has a bearing-mounted axle driven by V-belts from the motor (2:1 speed increase) on which 2-5 brushes can be mounted. The brushes are held against the work by a damping system consisting of two opposing springs which provide almost constant contact force despite slight irregularities of the work piece. The surface produced is evaluated at 2-60 μohms for welding. The aluminum dust should be removed from the surface by brushing or with alcohol (acetone is not acceptable). Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MM, IE

NO REF SOV: 000 OTHER: 000

Card 2/2



Sinyanskiy, V. I.

AUTHORS: Sinyanskiy, V.I., Solomon, L.Ye., Ionesku, P.D. 131-12-9/9

TITLE: Report on Matters Concerning Science and Technical Engineering of Other Countries (Iz inostrannoy nauki i tekhniki). The Functioning of Refractories Made from Forsterite in Forging Furnaces (Sluzhba forsteritovykh ogneuporov v podinakh kuznechnykh pechey)

PERIODICAL: Ogneupory, 1957, Nr 12, pp. 568-571 (USSR)

ABSTRACT: Forsterite refractories are mainly produced from serpentine raw material. Refractories, the main component of which is forsterite ($2\,MgO \cdot SiO_2$), have a weaker reaction with respect to iron oxides than the aluminum silicates of the fireclay products, and therefore they are not destroyed so quickly. The refractory lining of forging furnaces is subjected to considerable temperature fluctuations while in operation and also when operation is interrupted, which leads to a destruction of the arched roof of the furnace, and pieces of fireclay bricks fall on to the hearth of the furnace. Table 1 shows the properties of fireclay-magnesite and forsterite refractories. Further, the mineralogical composition of the forsterite is given and its mounting and operation are described in detail. The illustration shows a forsterite hearth brick after the smelting furnace campaign. In table 2 the chemical analyses and the state of the refractory forsterite bricks

Card 1/2

Report on Matters Concerning Science and Technical Engineering of Other Countries.
The Functioning of Refractories Made from Forsterite in Forging Furnaces

in various zones after the campaign of a forging furnace hearth are mentioned and explained in detail. Table 3 shows the average duration of the operation of such forsterite hearth linings, and table 4 does the same with respect to hearths of fireclay-, magnesite-, and forsterite bricks. Furthermore, the operation of various types of hearth linings is described in detail and the causes of the destruction are mentioned. There are 1 figure, 4 tables, and 3 Slavic references.

ASSOCIATION: Scientific Metallurgical Research Institute in Bukarest-IChEM (Nauchno-issledovatel'skiy metallurgicheskiy institut v Bukharest-IChEM)
Metallurgical Plant imeni 23 August (Metallurgicheskiy zavod im. 23-go avgusta)
Roumanian Peoples' Republic (Rumynskaya Narodnaya Respublika)

AVAILABLE: Library of Congress

Card 2/2

SINYANSKIY, V.G.; TURBINA, A.I.

Depolymerization of polyaminostyrene and of a copolymer of p-aminostyrene and divinylbenzene. Ukr. khim. zhur. 30 no.8: 868-869 '64. (MIRA 17:11)

1. Institut khimii polimerov i monomerov AN UkrSSR.

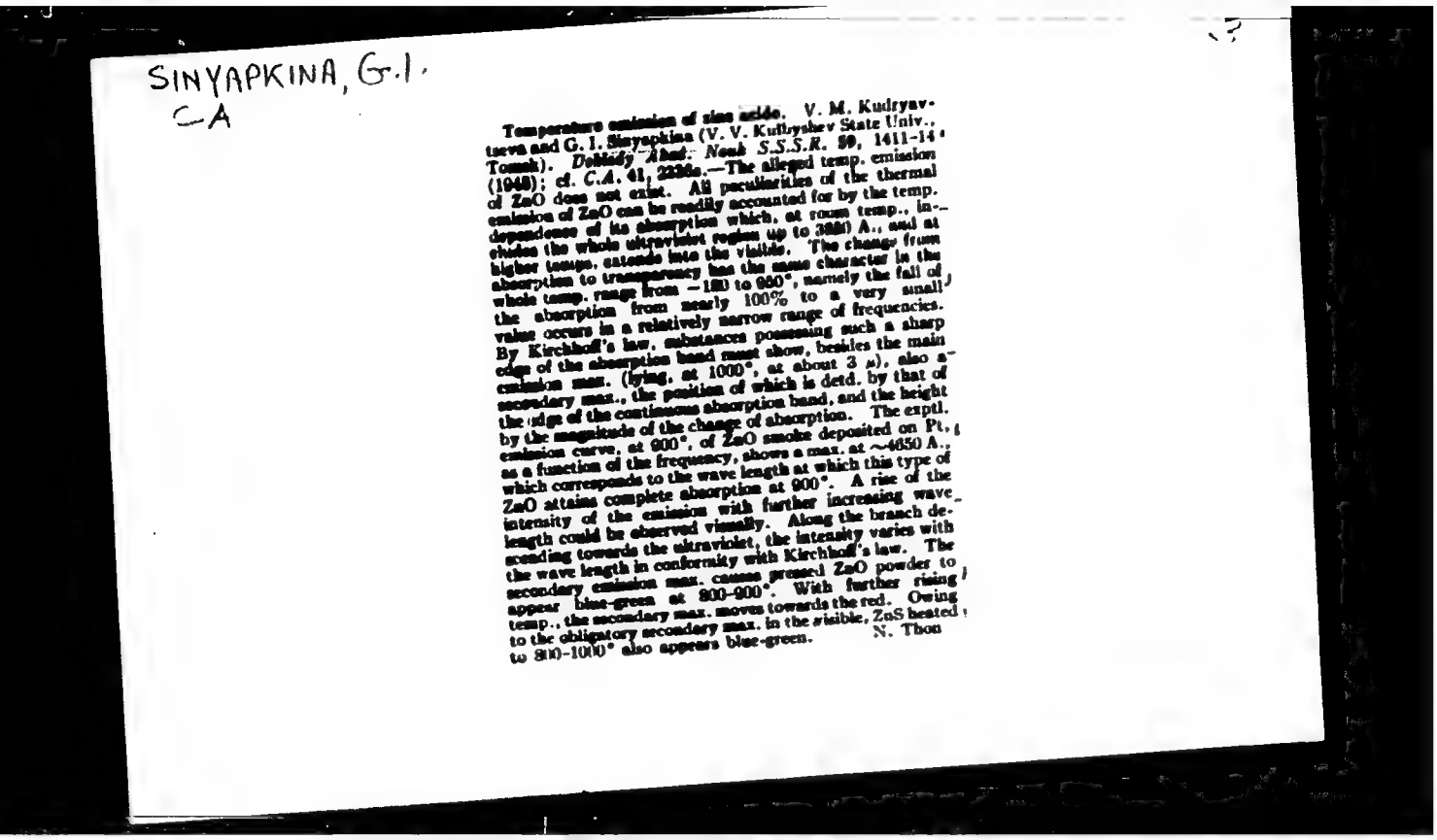
SINYANVIN, O. A.

SINYANVIN, O. A.

Tugboats

Work of port service vessels. Rech. transp. 12, No. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October 1952 1953, Uncl.



SINYAPKINA, G.I.
CA

Temperature emission of zinc oxide. V. M. Kudryavtseva and G. I. Sinyapkina (V. V. Kuibyshev State Univ., Tomsk). *Doklady Akad. Nauk S.S.S.R.* 59, 1411-14 (1948); cf. *C.A.* 41, 2236e.—The alleged temp. emission of ZnO does not exist. All peculiarities of the thermal emission of ZnO can be readily accounted for by the temp. dependence of its absorption which, at room temp., includes the whole ultraviolet region up to 3880 A., and at higher temps. extends into the visible. The change from absorption to transparency has the same character in the whole temp. range from −180 to 980°, namely the fall of the absorption from nearly 100% to a very small value occurs in a relatively narrow range of frequencies. By Kirchhoff's law, substances possessing such a sharp edge of the absorption band must show, besides the main emission max. (lying, at 1000°, at about 3 μ), also a secondary max., the position of which is detd. by that of the edge of the continuous absorption band, and the height by the magnitude of the change of absorption. The exptl. emission curve, at 900°, of ZnO smoke deposited on Pt, as a function of the frequency, shows a max. at ~4650 A., which corresponds to the wave length at which this type of ZnO attains complete absorption at 900°. A rise of the intensity of the emission with further increasing wave length could be observed visually. Along the branch descending towards the ultraviolet, the intensity varies with the wave length in conformity with Kirchhoff's law. The secondary emission max. causes pressed ZnO powder to appear blue-green at 800-900°. With further rising temp., the secondary max. moves towards the red. Owing to the obligatory secondary max. in the visible, ZnS heated to 800-1000° also appears blue-green. N. Thon

CA SINYAPKINA, G.I.

Temperature emission of titanium dioxide and zinc oxide in the visible part of the spectrum. G. I. Sinyapkina (Tomsk State Univ.). *Zhur. Fiziki. Tverd. Tela* 10, 881-3 (1940).—TiO_2 powder prepd. by heating H_2TiO_3 in a quartz tube at ~ 800° in hydrogen-free air at high temp. and becomes white on cooling. The emission spectrum at 800° has a max. at around 470 mμ, corresponding to an abrupt fall of the absorption. Between 800 and 1000°, the max. of the emission intensity, moves to longer wave length and broadens. The plot of $(\log \epsilon + 5 \log \lambda)$ as a function of $(1/\lambda)$ consists of 2 parallel straight lines, corresponding to the 2 branches of the emission spectrum curve at 1000°. Kirchhoff's law is valid for the high-temp. emission of TiO_2, as it is for ZnO (*C.A.* 44, 10818i); the emission is, consequently, pure thermal emission, and not temp. "luminescence." By the same criterion, the emission of ZnS at ~ 1050° is pure thermal emission, and is not linked with any chem. processes. The observed particularities of the emission are detd. only by particularities of absorption. N. Thon

SINYAREV, G. B. and DOBROVOLSKIY, M. V.

"Liquid Rocket Engines," Moscow, 1955.

Book contains detailed diagrams of motors, pumps, etc., for liquid rocket engines. There is information on all the known German WW II developments, namely the A-4, Valter, Wasserfall and Schmetterling. In addition the book contains information on two types of rockets which the reviewer had not heard of before. They are the P-3390 and the P-3395. It is assumed that these are German developments which came into the hands of the Soviets at the end of World War II, along with others described in the book. 485p Rec'd 05362

Eng. Index, Engr. p451

A-3,076,649

Sinyarev G. B.
(Gennadiy Borisovich)

Call Nr: AF 1070773

AUTHOR: Feodos'yev, V. I. and Sinyarev, G. B.

TITLE: Introduction to Rocket Technology (Vvedeniye v raketnuyu tekhniku)

PUB. DATA: Gosudarstvennoye izdatel'stvo oboronnoy promyshlennosti, Moscow, 1956, 375 pp., 15,000 copies.

ORIG. AGENCY: None given.

EDITOR: Kalashnikov, N. T., Candidate of Technical Sciences; Reviewer: Tikhonravov, M. K., Prof.; Editor of the Publishing House, Sokolov, A. I., Eng.

PURPOSE: Approved by the Main Administration of Polytechnical and Machine-building Faculties of the Ministry of Higher Education of the USSR as a textbook for institutions of higher technical education. This text is intended for students who have completed only two years of study, that is, students with no work in thermodynamics and aerodynamics.

Card 1/20

SINYAREV, GENNADIY BORISOVICH

PHASE I BOOK EXPLOITATION 351

Sinyarev, Gennadiy Borisovich and Dobrovol'skiy, Mstislav Vladimirovich

Zhidkostnyye raketnyye dvigateli; teoriya i proyektirovaniye (Liquid Propellant Rocket Engines; Theory and Design) 2d ed., rev. and enl. Moscow, Oborongiz, 1957. 579 p. Number of copies printed not given.

Reviewer: Panichkin, I. A., Doctor of Technical Sciences, Professor; Ed.: Senichkin, G. V., Engineer; Ed. of Publishing House: Petrova, I. A., Tech. Ed.: Zudakin, I. M.; Managing Ed.: Sokolov, A. I., Engineer

PURPOSE: This book was written as a textbook for tekhnikums, but may also be useful to students in institutions of higher learning and to workers specializing in the field of rocket engineering.

COVERAGE: The basic textbook on liquid propellant rocket engines is divided into two parts. Part one is concerned with "Theory and Thermodynamic Calculation of Liquid Propellant Rocket Engines" where fundamentals of Thermodynamics and Thermo-chemical analysis of the propellant are extensively presented. Part two deals with the "Design of Liquid Propellant Rocket Engines." The authors describe fundamental theories of liquid propellant

Card [illegible]

rocket engines and the design of their basic components. They provide the necessary data for the analyzing thrust and for determining the principal dimensions of various accessories and assemblies of liquid propellant rocket engines. Examples of the application of calculation methods are given. The book covers a considerable number of subjects, pertaining to rocket engine design and describes some equipment. A number of scientists who developed rocket propulsion in the USSR are mentioned. Recent developments in the study of complex phenomena occuring in liquid propellant rocket engines have made necessary the revision of some old concepts presented in the first edition of this book. As a result the new edition differs from the first in a number of chapters. Its extensive Table of Contents gives a detailed review of the book. There are 45 references, all of them Soviet (including 10 translations).

TABLE OF CONTENTS:

SINYAREV, G. B.

Introduction to Rocket Technology, By V.I. Feodosiev and G.B. Sinyarev.
New York, London, Academic Press, 1959.
344 P. Illus., Charts, Diagrs., Tables.
Bibliography: P. 340
Translated from the original Russian: Vvedeniye V Raketnuyu Tekhniku.

SINYAREV, G. B.

PHASE I BOOK EXPLOITATION SOV/4694

Feodos'yev, Vsevolod Ivanovich, and Genrikh Borisovich Sinyarev

Vvedeniye v raketnuyu tekhniku. (Introduction to Rocket Engineering) 2d ed., rev. and enl. Moscow, Oborongiz, 1963. 367 p. Errata slip inserted. 25,000 copies printed.

Managing Ed.: S. D. Krasil'nikov, Engineer; Ed. of Publishing House: N. A. Gorchakova; Tech. Ed.: V. P. Rorkin.

PURPOSE: This book is intended for students of schools of higher technical education.

COVERAGE: The book based chiefly on data published in non-Soviet sources, deals with general rocket engineering. It is directed to persons already acquainted with general physics, general chemistry, and the principles of higher mathematics and theoretical mechanics, but who have not yet studied thermodynamics or aerodynamics. The following topics are discussed: the construction and operational principles of various rockets and rocket engines, the fundamentals of propellant combustion and gas flow, simple problems in

Card 1/14

ballistics and aerodynamics, the general principles of stabilizing and controlling rockets in flight, and rocking and launching devices for rockets and rocket engines. Chapters [illegible] and parts of Ch. VI were written by G. B. Stepanov; the remainder was written by I. A. Merkulayev. No personal data are mentioned. There are [illegible] references, all Soviet (5 are translated into Russian).

TABLE OF CONTENTS:

Card 1/[illegible]

SINYAREV, Gennadiy Borisovich

Liquid-fuel rocket engines theory and designing, by G. B. Sinyarev and M. V. Dobrov l'skiy. Wright-Patterson Air Force Base, Ohio, 1960.

700 p. illus., diagrs., graphs, port., tables.

Translated from the original Russian: Zhidkostnyye Raketnyye dvigateli; teoriya i proyektirovaniye, Moscow, 1957.

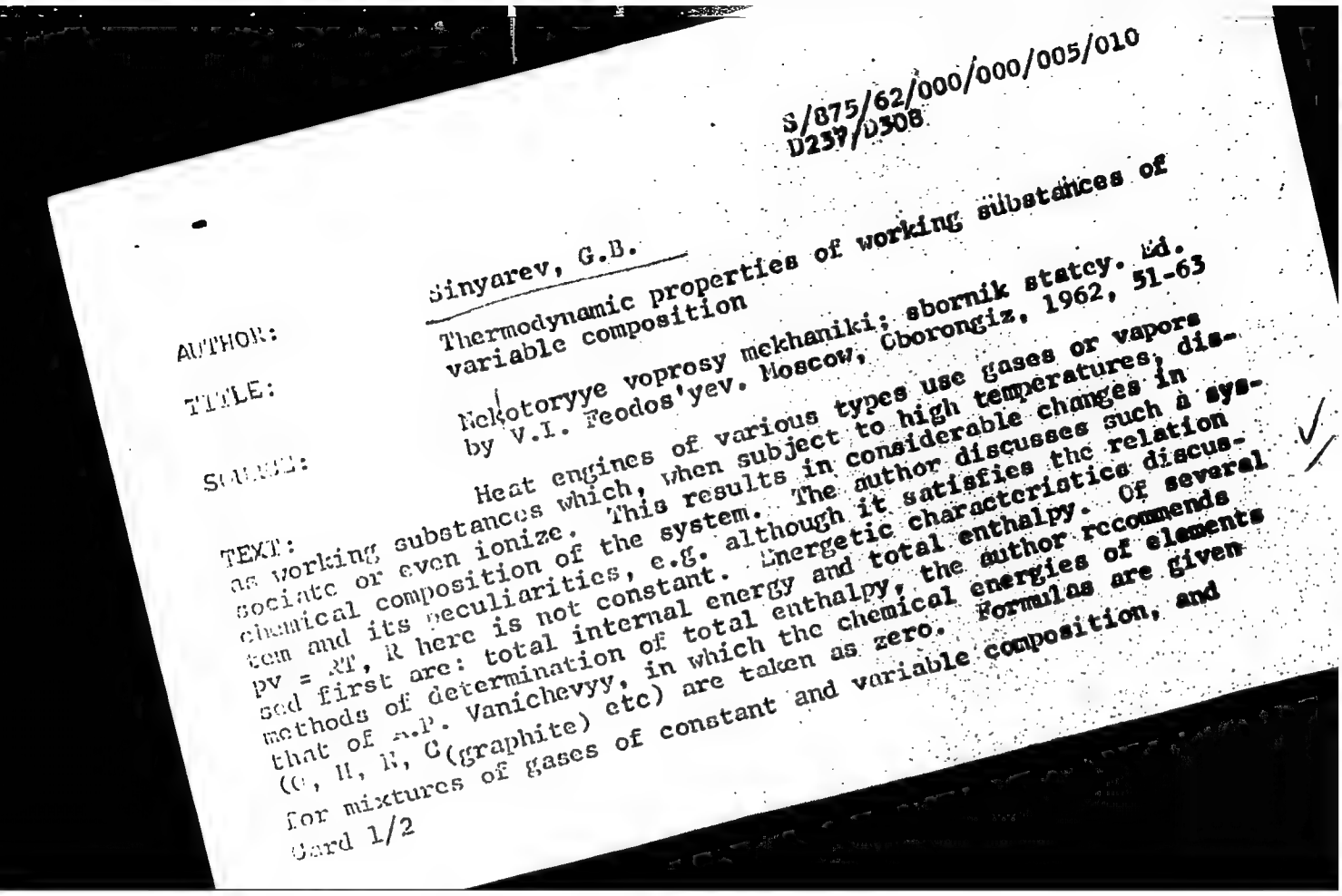
Includes bibliographies

SINYAREV, G. B.

Vvedeniye v raketnuyu [by] V.I. Feodos'yev [i] Izd. 2., ispr. i dop. Moskva, Oborongiz, 1961.

506 p. illus., diagrams, graphs, ports , tables,

Bibliography: p. 501



S/875/62/000/000/005/010
D237/D308

AUTHOR: Sinyarev, G.B.

TITLE: Thermodynamic properties of working substances of variable composition

SOURCE: Nekotoryye voprosy mekhaniki; sbornik statey. Ed. by V.I. Feodos'yev. Moscow, Oborongiz, 1962, 51-63

TEXT: Heat engines of various types use gases or vapors as working substances which, when subject to high temperatures, dissociate or even ionize. This results in considerable changes in chemical composition of the system. The author discusses such a system and its peculiarities, e.g. although it satisfies the relation $pv = RT$, R here is not constant. Energetic characteristics discussed first are: total internal energy and total enthalpy. Of several methods of determination of total enthalpy, the author recommends that of A.P. Vanichevyy, in which the chemical energies of elements (C, H, N, C(graphite) etc) are taken as zero. Formulas are given for mixtures of gases of constant and variable composition, and

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D237/D308

Thermodynamic properties ...

differences are discussed. The quantities considered are the enthalpy, C_p and C_v. Finally, the processes of adiabatic and isobaric combustion are discussed and it is pointed out that the adiabatic equation can be utilized in the determination of the velocity of sound in gases. There are 2 figures.

Card 2/2

45644

S/875/62/000/000/006/010
D237/D308

11,5300

AUTHOR: Sinyarev, G.B.

TITLE: Generalized systems of equations, determining the equilibrium composition of a working substance

SOURCE: Nekotoryye voprosy mekhaniki; sbornik statey. Ed. by V.I. Feodos'yev. Moscow, Oborongiz, 1962, 64-79

TEXT: The author formulates systems of equations necessary for the determination of the composition of the working substance in which any chemical reactions, up to the dissociation of molecules into atoms, may take place. For gaseous working substances containing m gaseous components, and n chemical elements, m + 1 equations are found necessary, of which (m - n) equations determine chemical equilibrium constants; n equations are those of conservation of elements and one is Dalton's equation. When a condensed phase is present, then m + s + 1 equations are required, where s is the number of components in the condensed phase. Finally, the case of an ionized working substance composed of n elements and containing m non-ionized

Card 1/2 SEE S/875/62/000/000/006/010

45645

S/875/62/000/000/007/010
D237/D308

AUTHOR: Sinyarev, G.B.

TITLE: A general method of solution of the system of equations determining the equilibrium composition of a working substance

SOURCE: Nekotoryye voprosy mekhaniki; sbornik statey. Ed. by V.I. Feodos'yev. Moscow, Oborongiz, 1962, 80-106

TEXT: The author gives a general method of solution of systems of equations described in the preceding paper (pp. 64-79 in the same collection). Successive approximations are used. All the unknowns are split into two groups, to one of which are assigned some initial values which are later corrected as required and which play the part of independent variables, while the other group is called dependent, and is determinable by means of the given values of the first group. E.g. if there are (m + 1) equations and s independent variables are chosen, then (m + 1 - s) equations are used to determine dependent magnitudes while the remaining s equations are

Card 1/2

A general method of solution ...

S/875/62/000/000/007/010
D237/D308

used to determine the degree of error in assigning the values to the independent variables, and subsequent corrections. If the errors Δ is are large, their corrections can be expanded into a Taylor's series and linearized. The resulting s equations can be solved by th. method of Gauss-Seidel, Kholetskiy, or by iteration. Two methods of linearization of errors are discussed, namely a direct one and a logarithmic one; the direct one is found preferable. The logarithmic method is recommended for initial calculations of fuels of novel composition, when the initial values assigned to independent variables are more or less arbitrary. The work is illustrated by numerical examples throughout. ..V. Kozlovskaya under the guidance of Engineer T.A. Pshennikova is mentioned as responsible for numerical work and tabulation. There are 11 tables.

Card 2/2

L 53656-65 EWG(j)/EWT(l)/EWT(m)/EPF(c)/EWG(m)/EPR/EWP(t)/EWP(b) Pr-4/Ps-4 IJP(c)
JD/JW

ACCESSION NR: AP5009477 S/0145/65/000/002/0099/0110

38
36
B

AUTHORS: Sinyarev, G. B. (Candidate of technical sciences, Docent)

21

TITLE: Complete thermodynamic functions and their use for the computation of complex thermodynamic systems at the state of equilibrium

SOURCE: IVUZ. Mashinostroyeniye, no. 2, 1965, 99-110

TOPIC TAGS: thermodynamic equation of state, thermodynamic equilibrium, chemical equilibrium, rocket motor

16

ABSTRACT: This paper explains and applies the chemical portion of complete enthalpy, which must be considered in certain calculations, e.g., for a rocket motor. The equation considered is: Complete enthalpy I equals the sum of the chemical energy Q and the individual enthalpy H. The first section of the article introduces chemical energy into the equation $p.v = R.T$ and determines the absolute complete energy U. The term "general thermodynamic potential" and its differential are described (the differential of general thermodynamic potential = $dU - T\,dS + p\,dv$). If two of the parameters in this equation are constant, simple equations can be obtained for the complete potentials, including the chemical energy. These

Card 1/2

L 53656-65

ACCESSION NR: AP5009477

2

conditions are shown in a table. Other equations are given which describe the relation between the complete potential, molecular weight, partial pressure, etc. The second section of the article explains the computation process when the pressure and temperature are given. In an example the reaction between hydrogen and oxygen is analyzed. The third section describes the condition at the end of the reaction, when the pressure is given. The fourth section deals with a further application, showing expansion at a constant entrophy within a pressure limit. Orig. art. has: 1 table and 54 equations.

ASSOCIATION: none

SUBMITTED: 060ct64 ENCL: 00 SUB CODE: TD, PR

NO REF SOV: 008 OTHER: 000

llc

Card 2/2

L 63572-65 EWT(d)/T

ACCESSION NR: AP5015555 UR/0286/65/000/008/0098/0098
629.13.01/06

AUTHOR: Sinyashin, G. B.; Nedzel'skiy, L. V. 89

TITLE: A device for engaging and disengaging a plug-type connection on a beam-type carrier support. Class 62, No. 170306.

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 8, 1965, 98

TOPIC TAGS: plug connection, beam type carrier support, engagement mechanism, disengagement mechanism

ABSTRACT: An Author Certificate has been issued for a device for engaging and disengaging a plug-type connection on a beam-type carrier support. The unit consists of a cantilever bracket in which a pivoted double-arm lever connected by a tie rod to a single-arm lever is mounted. The single-arm lever is rigidly connected to a rotating shaft which works in conjunction with the mechanism's actuator. To increase the alignment rate of the socket with the plug-type connection, to decrease stresses on the actuator during engagement of the connection, and to improve reliability of disengagement within the fairing support, a segment gear is mounted on the shaft of the single-arm lever. This gear meshes with the actuator-mechanism pinion gear

Card 1/3

L 63572-65

ACCESSION NR: AP5015555

which, by means of a rocker mechanism mounted on the same shaft, is hinged to the connecting rod of a pivoting spring-type damper. The cylindrical outer casing of the damper is hinged through a subconnection to the shaft holding the double-arm lever. This lever connects with a rod which holds the socket of the plug-type connection. The mechanism for disengaging the lugs of the beam-type support is rigidly connected to a lever on the shaft of the segment gear by means of a telescopic tie rod. (See Fig. 1 of the Enclosure.) Orig. art. has: 1 figure. [LB]

ASSOCIATION: none

SUBMITTED: 21Nov63 ENCL: 01 SUB CODE: AC, IE

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4020

Card 2/3

L 63572-65
ACCESSION NR: AP5015555

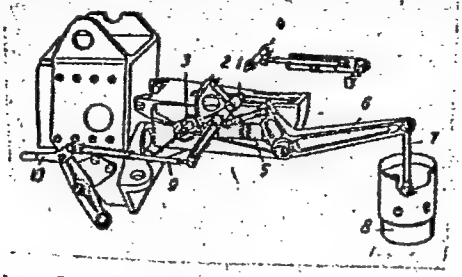

Fig. 1. Engagement and disengagement device

1 - Single-arm-lever shaft; 2 - segment gear; 3 - drive pinion; 4 - damper rocker mechanism; 5 - pivoting spring-type damper; 6 - double-arm lever; 7 - socket rod; 8 - plug-type connection socket; 9 - telescopic tie rod; 10 - disengagement-mechanism tie rod.

Card 3/3

PETROVA, M.A., prof.; SINYASHIN, N.I., assistent

Efficient method for the decontamination of sewage. Zdrav. Kazakh. 17 no.8:15-17 '57. (MIRA 12:6)

1. Iz kafedry gigiyeny pitaniya Kazakhskogo gosudarstvennogo instituta im. V.M.Molotova.
(SEWAGE--PURIFICATION)

SINYASHIN, N.I.; FEDORCHUK, V.P.; YAKUBOVA, A.N.

Obtaining dry easily soluble therapeutic sera [redacted]
"Diaferm-III" method; report No. 1. Trudy TashNIIVS 6:71-74 '61.
(MIRA 15:11)

(SERUM)

ABIDOV, A.A.; SINYACHIN, N.I.; D'YACHENKO, S.A.

Genetic recombination in intestinal bacteria. Report No.7.
Uzb. biol. zhur. 9 no.1:67-68 '65. (MIRA 18:6)

1. Tashkentskiy nauchno-issledovatel'skiy institut vaktsin i syvorotok.

SINYAVER, B.V., referent

Cooper-nickel plant in Fort Saskatchevan, Canada. Biul. TSIIN tsvet. met. no. 11:39-40 '58. (MIRA 11:7)
(Fort Saskatchevan(Canada))--Metallurgical plants)

L 49412-65 EWG(j)/EWT(m)/EPF(c)/EPR/EWP(t)/EWP(b) Pr-4/Ps-4 LJP(c) JD/JG

ACCESSION NR: AP5009923 UR/0032/65/031/004/0508/0509

41
38
B

AUTHORS: Kreyngol'd, S. U.; Bozhevol'nov, Ye. A.; Sinyaver, L. G.

TITLE: An arrangement for recording the kinetics of reactions

SOURCE: Zavodskaya laboratoriya, v. 31, no. 4, 1965, 508-509

TOPIC TAGS: reaction kinetics, colorimetric analysis, curve fitting, least square method, reaction rate, reaction temperature, error measurement, density measurement / FEK M photoelectronic colorimeter, FEK N photoelectronic colorimeter, EPP 09 automatic recorder

ABSTRACT: A simple device based on a photoelectronic colorimeter was developed for recording reaction speeds with the help of colored indicator substances. A straight line is produced on the tape of the automatic recorder. The slope of this line is proportional to the speed of the reaction of the zero or the first order in accordance with the indicator substance. The system is most satisfactory when the coloration of the indicator substance decreases and the products are colorless. The setup consists of either an FEK-M or FEK-N photoelectronic colorimeter with an EPP-09 recorder. A 4-5 kohm variable resistor is connected in parallel with the input of the EPP-09, and the resistance is selected on the

Card 1/2

basis of the maximum optical density anticipated in the measurement. A solution is placed in both containers of the system, and an optical wedge is used for balancing the two light fluxes. The test solution is then placed in the right container, and the signal $i = k (I_l - I_r)$ is recorded on the automatic recorder (I_l and I_r are the light fluxes striking the left and the right photoelements). If the change in density is $< 40\%$, then i vs time is a line with only a slight curvature. The divergence of the points on the curve from the straight line constructed by the least square method is $< 2\%$ for both the zero order and the first order reactions. Thus, the adjusted experimental curve indicates the reaction speed. The method was checked for the reaction of iron determination with the use of dark-blue acid chrome (see Fig. 1 on the Enclosure). The reaction speed is proportional to the iron ion concentration, decreases in the the presence of multivalent cations, and rises with the increase of temperature and the H_2O_2 concentration (up to $\sim 10^{-4}$m). The sensitivity at 50C is 0.002 mkg/ml, and the relative error in the range 0.01 mkg Fe^{3+} is 7-10%. Figure 2 on the Enclosure shows the linear relationship of tangent α to iron. This method gave an iron determination in lanthanum oxides and in germanium tetrachloride with an error $\sim 15\%$. Orig. art. has: 2 tables and 2 figures.

L 49412-65

ACCESSION NR: AP5009923

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv (All-Union Scientific Research Institute of Chemical Reagents and Extremely Pure Chemical Substances)

SUBMITTED: 00 ENCL: 02 SUB CODE: GC

NO REF SOV: 002 OTHER: 000

Card 3/5

L 44308-65

ACCESSION NR: AP5009501 S/0209/65/000/004/0066/0067

AUTHORS: Karepin, V. (Major of technical service); Sinyavin, A. (Senior technician, Lieutenant)

TITLE: How to calculate engine operating time

SOURCE: Aviatsiya i kosmonavtika, no. 4, 1965, 66-67

TOPIC TAGS: engine/ MA 505 00 05 counter, TKE 21 relay, TKE 52 relay

ABSTRACT: An automatic unit was developed for use with the counter MA-505-00-05. The device automatically calculates the following engine operating times: 1) total operating time on the ground and in the air; 2) airborne operating time; 3) operating time in a forced condition; 4) operating time in a maximum condition (98% rpm).

the forced counter and disconnects the maximum counter. A blocking signal from a

Card 1/2

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ACCESSION NR: AP5009501 O

universal temperature regulator is used to block the maximum counter when the controls are set at maximum but the engine is still not warmed and is operating below maximum rate. The system has been tested on the ground and in flights and has been found accurate. With slight modifications of the external connections the device can be used on the engines of aircraft and helicopters of any type. Orig. art. has:

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Compound BS--plasticizer for building mortars and setting inhibitor for gypsum. Rats. i izobr.predl.v stroi. no.137 '56. (Mortar) (MLRA 9:9)